

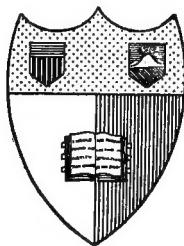
LANDSCAPE
GARDENING

FRANK A. WAUGH



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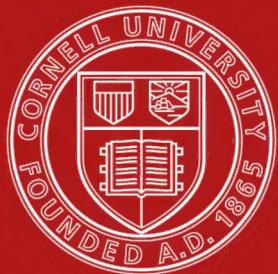
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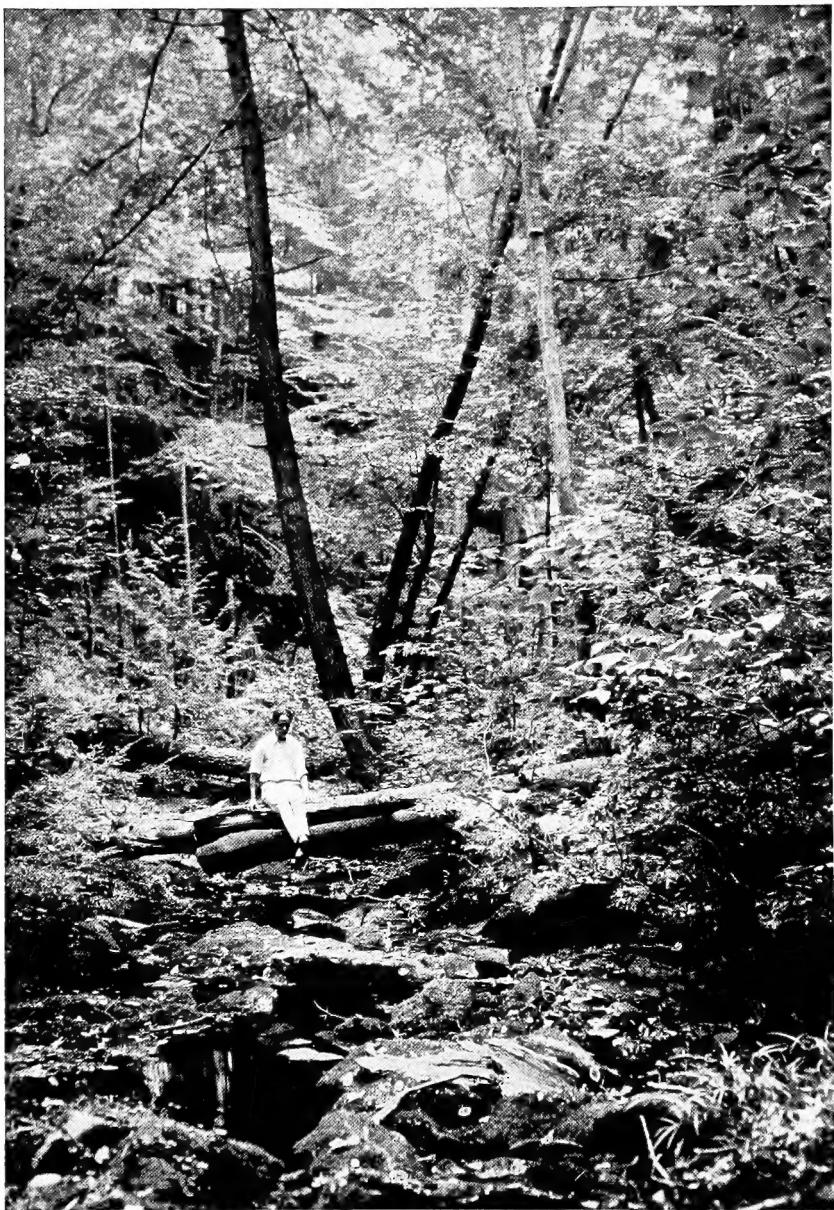
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HOLLAND GLEN — NEIGHBORHOOD PARK IN BELCHERTOWN, MASS.

Frontispiece

TEXTBOOK
OF
LANDSCAPE GARDENING

DESIGNED ESPECIALLY FOR THE
USE OF NON-PROFESSIONAL
STUDENTS

BY
FRANK A. WAUGH

Illustrated

NEW YORK
JOHN WILEY & SONS, INC.
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1922

W/T

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TO
LIBERTY HYDE BAILEY

DEAR FRIEND:

You have taught non-professional courses in Landscape Gardening. In this work you led the way. You have also loved the native landscape, and have written poems about it.

For many years I have wished to dedicate a book to you, Writer of Books, Teacher of Teachers, and Believer in the Landscape but never having written anything worthy of such distinction I have desisted until now, when it appears certain that I never can produce such a book, but yet more certain that my respect and affection for you should find some formal expression. And so for these reasons this book is inscribed with your name, as indeed every related subject has already been marked with your name and freshened by your touch.

You may be well assured that this frail acknowledgment of esteem is but a tithe of all that is owed and acknowledged to you by your thousands of former students, in which group of fortunate persons I greatly rejoice to have found myself.

FRANK A. WAUGH

January, 1922.

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PLAN AND PURPOSE OF THIS BOOK

This book is designed for the instruction of non-professional students in landscape gardening, that is for those who do not intend to become professional landscape gardeners. At the same time the author sincerely hopes that the book will not turn any good men away from the profession.

The book has been prepared with certain definite objects in view, as follows:

1. To teach the principles of universal art, viz. the principles of order and design. For the most part these subjects are here introduced in concrete problems rather than in abstract statements of principles.
2. To give a working understanding of these principles as applied in the art of landscape gardening.
3. To apply the principles of landscape gardening to the domestic problems of the average citizen.
4. To apply the principles of landscape gardening to civic problems.
5. In this way to arouse an intelligent and constructive interest in civic problems, and to offer a practical working basis of citizenship.
6. To bring the student into intelligent contact with the native landscape; to give a key to the unsurpassable and omnipresent beauty of the native landscape; to indicate the great personal and social value of the landscape; to indicate what should be done by nations, states and communities for the preservation and use of the native landscape.

Methods

The plan of this book is to teach the necessary lessons through the active work of the student upon concrete problems. It is essential that the student should come into direct contact with these problems and should do the work with his own hands and mind. He is then likely to secure such information as he can use and remember such as he uses.

Open discussions amongst the members of the class are specifically suggested in several lessons and may profitably be undertaken on many others. It is hoped that an intelligent and sympathetic teacher will usually be at hand to direct the discussions but not to monopolize them. It is vitally important in a subject of this sort that the student should express himself rather than to accept dictation from anyone. Authority, which has a high place in morals and religion, is of doubtful value in science, and of no value whatever in art.

The Field

The subject of landscape gardening, even in its non-professional aspects, involves a wide range of material. A word should be said about the resources upon which it is necessary to draw.

1. *Surveying and engineering:* The student must know something of simple surveying and engineering. It is quite possible that a college student will get this information in some other course, perhaps in farm engineering and surveying. When such instruction is elsewhere provided it may naturally be omitted from the present course.

2. *Drawing* is the regular language of the landscape gardener. Every student must do some sort of mapping, plan making and designing. Quite possibly this will be available in other courses. If it is not some attention must be paid to it here.

3. *Plant materials:* Some acquaintance with trees, shrubs, vines and hardy herbaceous materials will be necessary for any

PLAN AND PURPOSE OF THIS BOOK

student of landscape gardening. It has been the custom however in many schools to magnify this branch of the subject out of proportion to the other phases of landscape gardening. In some schools this knowledge of plant materials is available in other courses, and in such cases this section of the present book may be omitted. The plan of having this subject handled in a separate course is to be strongly recommended.

4. *Architectural materials* and methods must be used more or less in landscape gardening. Professional students nearly always take collateral courses in architecture. The non-professional student should give such attention to this subject as time and opportunity make possible.

5. *Principles of design:* These principles are universal and are sometimes well taught in departments of drawing or under the name of industrial design, home decoration or other characterizations. These principles are exceedingly important and all emphasis should be placed upon their study.

6. *Domestic problems of landscape gardening involving the application of the principles of design to home grounds, farms and estates:* This field is sometimes assumed to constitute the whole subject of landscape gardening and a number of books have been written on these particular topics. It is desirable at the present time merely to keep this branch of landscape gardening in its proper relation to other branches of the subject.

7. *Civic art*, including city planning, regional planning and country planning, constitutes a large and highly important application of the principles of landscape gardening.

8. *The native landscape* not only forms the foundation of landscape gardening but also supplies a reservoir of beauty upon which the human race has drawn from the beginning of time and which is now of the utmost importance to our national culture. This natural landscape is therefore one of the principal subjects of study in the field of landscape gardening.

It will be understood at once therefore that the subject of

landscape gardening covers a large and varied field. In a short course of one term, or even of one year, it will be impossible to exhaust the subject in all its different phases. If some portions of the material can be temporarily detached for study in other courses the time thus gained may be advantageously applied to the remainder. In any case it will seem desirable to the teacher and the student to emphasize certain phases of the subject, giving less attention to others.

Laying out the Course

The necessity for this selection will be understood further through a simple calculation in arithmetic. The present book offers 62 chapters, the slightest of which will make an adequate lesson for any class, while the larger chapters contain materials and problems enough to occupy ten or a dozen lessons. We may perhaps estimate that the material here offered will be sufficient for 150 substantial class exercises.

Yet this is not all. It is exceedingly important to the plan of this book that the work of the student shall take hold upon the neighborhood in which he finds himself. Teacher and student should therefore strive to develop all the practical problems of the neighborhood, whether they are specifically outlined in the text or not. If the teacher therefore has reasonable enterprise and imagination he will add a considerable number of exercises to those here outlined.

Now a one-semester college or high-school course having three exercises a week cannot possibly handle more than 48 exercises. If the course in landscape gardening is continued for an entire year it will still be impossible to have more than 96 exercises, and this number will probably be considerably diminished through the usual exigencies of examination periods, vacations and the like.

Under these circumstances it will be necessary for each teacher at the beginning of the course to outline a program of exercises equal to the number of periods at his disposal. This program will

PLAN AND PURPOSE OF THIS BOOK

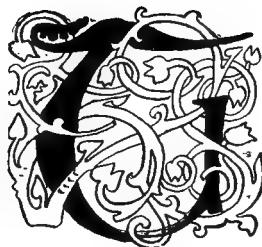
of course include any exercises of his own invention. It may be hoped that the student will not altogether neglect the exercises which are not assigned and required. Any intelligent student who uses this text-book for three or four months is pretty apt to know a good deal about its entire contents. If the course is as successful as it ought to be and the interest of the student is thoroughly awakened, he will naturally exhaust the text-book and reach out for other sources of information, which indeed exist in great abundance.

Finally the author wishes the teacher and student the utmost pleasure in the study of the fascinating subject of landscape gardening.

LANDSCAPE GARDENING

LESSON 1

INTRODUCTION



THE purpose of this lesson is to define certain elementary terms and present certain general principles necessary to an understanding of subsequent lessons.

Definition

Landscape gardening (called also landscape architecture, landscape engineering or landscape design) is the art of improving land for human use and enjoyment in such a manner as to combine the maximum of utility with the maximum of beauty.

Art

In this definition the term art signifies fine art in distinction from the practical arts or hand-crafts. The definition implies that landscape gardening is a sister art with painting, sculpture, architecture and music. There are, in fact, many points of close resemblance amongst all these arts.

Art is the pursuit of beauty. The effort to realize beauty in any medium is art. Sweet sounds harmoniously combined constitute music; beautiful or noble ideas beautifully expressed in metrical language are poetry; beautiful forms and colors pleasingly united on canvas are painting; beautiful trees, hills and water arranged to make an attractive picture are landscape gardening. Beauty is the end of art.

Every work of art must be pleasing to the senses. Music pleases the ear; good landscape pleases the eye. This element of sensuous pleasure is essential. It has sometimes been argued that art must satisfy the intelligence; also that it must satisfy the moral judgment. Neither statement is true. Art is independent of logic and of morals, though either one may be brought in at times to the manifest advantage of art.

Art is to be understood as distinguished from science. "Science is classified knowledge." Art is the pursuit of beauty. Science seeks to know the truth, to defend the truth and to overthrow what is false. Art strives only to know what is beautiful, to defend the beautiful, and to rid the world of everything ugly.

The Field

Landscape gardening has for its field of operations "all outdoors" in a quite literal sense. Some of the main purposes, however, are the following: (1) To improve home grounds in order that the exterior of every home shall be clean, orderly and beautiful. (2) To improve public grounds in the same way and for the same reasons. This branch of landscape gardening is called Civic Art (see Lessons 37-48). (3) To select, protect, and make accessible the best examples and types of the native landscape, as is done in National and State parks (see Lessons 56-62). (4) To interpret the beauty of the landscape.

Styles

It is customary to recognize several different styles in landscape gardening. Style may be defined as the national or racial quality in landscape gardening. In this art the word *style* has a meaning wholly different from that given to it in the other arts, especially in literature.

The styles usually mentioned are the English, the Italian and the Japanese; but there exist, at least theoretically, also a Chinese style, a Persian style, an Egyptian style, etc. The English, Italian

INTRODUCTION

and Japanese styles have sometimes been called respectively the natural, the formal or architectural and the picturesque. This synonymy is very superficial and should generally be avoided.



FIG. 1. LANDSCAPE GARDENING IN THE NATURAL STYLE

More logically stated the natural or informal method on the one hand and the architectural or formal on the other, are not styles at all, but fundamental garden forms. Any of the properly national styles may be either formal or informal. As a matter of fact the formal and the informal methods have both been used successfully both in Italy and in England.

These distinctions, however, are somewhat abstruse and hardly necessary to the work of the beginner. The young student may safely speak of formal gardening and of the natural style because these terms are in common use even though they are slightly illogical.



FIG. 2. THE FORMAL STYLE — CALIFORNIA. Photograph by John W. Gregg

Utility and Beauty

Another phrase in our definition should have a short examination. We have said that our object in landscape gardening is to secure the maximum of utility combined with the maximum of beauty. It is sometimes assumed that utility and beauty are conflicting qualities and that beauty is necessarily marred whenever we intrude anything "practical" or merely useful. This idea is absolutely wrong and mischievous. The fundamental truth is the exact opposite, viz. that the maximum of beauty can be realized only when practical requirements have been fully met. So radical is this principle that some of the great philosophers have held that this satisfaction of practical utilities is the sole foundation of beauty.

In common experience we certainly do find many instances in which practical utilities are far from beautiful. A steel smokestack, an iron bridge, a wooden silo are almost certain to be ugly. But

INTRODUCTION

there are inoffensive smokestacks, noble and beautiful bridges and distinctly good-looking siloes. And the beautiful smokestacks, bridges and siloes are just as useful as the ugliest ones ever built.

It is often thought that a large part of landscape gardening is directed to covering up and disguising unsightly but necessary objects. Unfortunately work of this sort has to be done sometimes: — we seldom find perfectly ideal conditions in this present world; but our first effort should always be to render every useful object beautiful instead of merely trying to hide it. Particularly reprehensible is the practice of covering up dirty and unsanitary nuisances by such means as planting screens of “ornamental” trees and shrubs. As though a garbage dump could be ornamented!



FIG. 3. A JAPANESE GARDEN. The Japanese Style in Japan

Readings

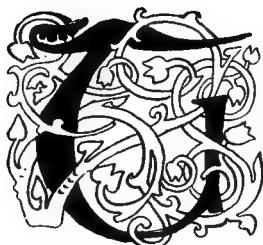
The pupil will easily find innumerable books on art and enough on landscape gardening, some good, many indifferent, others worth-

TEXTBOOK OF LANDSCAPE GARDENING

less. He should read as many good books on art as possible. In the field of landscape gardening a large and valuable literature is available. Some of the most important works are listed in the Bibliography at the close of this book; these and other books on the subject should be read and digested as opportunity offers.

LESSON 2

GENERAL PRINCIPLES



HERE are certain general principles underlying all art, including landscape gardening. The most important of these principles must now be stated and should be given careful study by the pupil.

Unity

The first principle of all art is unity. This means that each work of art, large or small, must have *one* and only one meaning, and that every part shall contribute to this meaning. Stated in physical terms, all parts must be organized into one body, each part being completely subordinate to the interests of the whole. Every part which does not assist in this central effect must be expunged, no matter how beautiful or interesting it may be in itself.

The extreme term in unity is monotony. When only one color, only one tone, only one figure is used the result may be monotonous. A garden planted with nothing but hollyhocks or a cemetery set exclusively with red cedars would probably be monotonous. Even so it is better to have monotony than to lose unity; and in particular cases monotony is the height of artistic achievement.

The elimination of diverse colors, and forms therefore tends toward unity, or at least toward simplicity, which is also desirable in itself. Nearly all landscape gardening shows too many forms, too many colors, too many different kinds of plants. The instances in which unity is carried too far toward monotony are so rare that they are doubly interesting as curiosities.

Unity is frequently secured through the development of utilities. If every part of a work of landscape gardening has a definite and

obvious practical purpose this dominating purpose reconciles all parts and unifies the whole.

In actual practice the most powerful means of securing unity lies in adopting a clear-cut motive (see below) and adhering rigidly to it.

Variety

Next to unity stands variety as a fundamental necessity in art. Indeed art is sometimes defined as unity in variety. To make a work of art permanently interesting and pleasing a certain amount of variety is needful.



FIG. 4. THE BROOK MOTIVE

Obviously there is a certain antagonism between unity and variety. Either one would be comparatively easy to achieve if the other could be disregarded. Yet the two are not incompatible. It is nearly always possible to secure both in the same composition.

GENERAL PRINCIPLES

It is possible but not always easy, for the greatest skill of the artist is required to this precise end, viz. to bring together many various elements into one harmonious whole. The beginner need not be surprised or discouraged if he is unable at first to accomplish all that the best artists can accomplish, but he should have faith to believe that a satisfying solution may be reached even in the face of great difficulties.

In landscape gardening variety is particularly easy to reach — so easy in fact that it is nearly always overdone. The landscape gardener is able to gain variety in the following ways, amongst others: (1) in topography and ground forms; (2) in grading land; (3) in the infinite number of trees, shrubs and flowers at his disposal; (4) in their varied forms, and (5) colors, and (6) in the endless combinations in which they may be grouped; (7) in the introduction of architectural and sculptural embellishments; (8) in the use of water, still or flowing (9) in changes of season, of weather and of the hours of the day.

The landscape gardener must have all these resources at his command, but he must use them with great restraint or he will presently find that he has sacrificed his last opportunity for unity of effect.



FIG. 5. THE POND AS A LANDSCAPE MOTIVE

Motive

Every worth-while work of art has a subject, theme or motive. In landscape gardening the term motive is perhaps most eligible, though all three words mean the same thing. Everyone is familiar with the theme or subject in literature, and those who have studied



FIG. 6. THE MOUNTAINS AS A LANDSCAPE MOTIVE. Photograph by Fred C. Sears

music should understand what is meant by a musical theme. It is also reasonably clear that any painting must have some sort of subject.

It is somewhat difficult however to state exactly what is a landscape gardening motive. Let us illustrate by saying that a park at Niagara Falls could hardly do anything else than exhibit the Falls. That would necessarily be the theme or motive. So a more

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commonplace park running along a mile of some minor stream would nevertheless find the stream beautiful, would strive primarily to exhibit the beauties of the stream — would in short adopt the stream as its motive. That park would be the story of Paint Creek or Duck River just as truly as "Hamlet" is the story of Hamlet.

It is impossible here to expound the principles upon which landscape motives are chosen and worked out. It may be barely suggested that, as a rule, in each landscape tract of land developed the selected motive is presented in a series of paragraphs or episodes. In each paragraph some different treatment is given to the motive. For illustration let us imagine four paragraphs of the Paint Creek motive suggested above. In the first picture we might see the rapids with the water singing over the stones; at the second paragraph we might see flat quiet water with stately beech trees reflected from the opposite shore; at the third paragraph we might cross the stream over a bridge getting a long view down the channel toward a distant hill; at the fourth paragraph, at the bend of the creek, where the old Indian camp used to be, the park maker might introduce two or three Indian tepees, always of great pictorial value, and these would serve to recall the history and legends of Paint Creek.

Analogy

The youthful pupil in high school or college will find the analogy between rhetoric and landscape gardening particularly suggestive at this point. He has been taught to write essays, compositions or "themes." He has been taught the demands of unity — has learned to stick strictly to one subject. At the same time he has been taught to give the subject varied treatment, sometimes serious, sometimes witty, sometimes statistical, sometimes poetic. Finally he has been taught to treat his theme paragraphically. Each paragraph must have a quality of its own but it must first of all bear directly upon the theme in hand. Landscape gardening and literature come very close together in all these points.

Exercises

1. Select some piece of landscape gardening in the immediate vicinity, preferably the best example available. Examine this critically with respect to unity and variety. Indicate exactly where unity has been gained and where it has been lost; also where desirable variety begins to be undesirable. It is important in this exercise to discover the maximum of good. Much less emphasis should be placed upon defects.

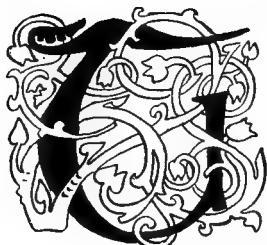
2. Select some tract of park or comparatively wild land in the vicinity. Study this with care endeavoring to select a landscape motive most natural to the tract. Define this motive in writing. Then project three to six separate episodes or paragraphs, describing just where and how the several episodes might be developed.

References

HUBBARD and KIMBALL, *Landscape Design*, New York, 1917.
WAUGH, *Landscape Gardening*, New York, 1900.
DOWNING, *Landscape Gardening*, Chap. II, New York, 1921.

LESSON 3

DESIGN



THE purpose of this lesson is to develop the idea of design and to give the pupil a few elementary exercises dealing with problems in this field.

It has already been explained in lesson 1 that landscape gardening is an art which seeks to promote beauty. One of the principal aids to beauty is order, and order is achieved by design.

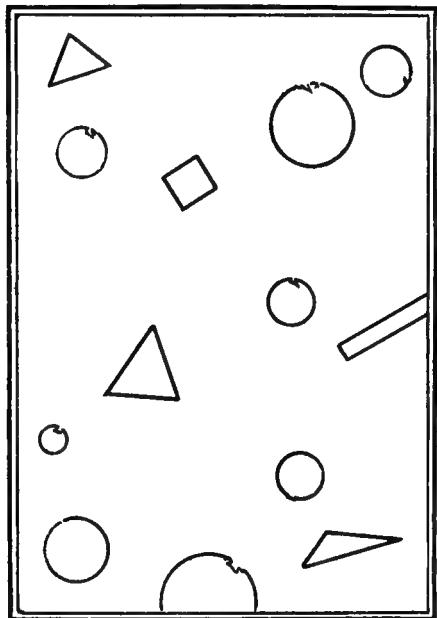
Definition

Design might be defined as the orderly arrangement of all the elements in a given area. The best design is that which achieves the greatest degree of order, and the poorest design is one which shows the maximum of disorder.

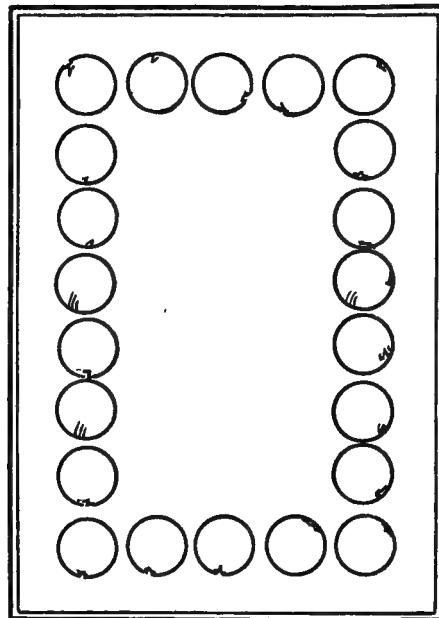
The most direct means of gaining order is to increase the number of agreements among objects. If objects are all of the same size, form, color, much has been gained in comparison with a field in which the objects are of miscellaneous sizes, forms and colors. However after the designer has secured objects all alike an additional and important degree of beauty can be gained by their orderly arrangement. They may be placed with their main lines standing in the same direction; they may all be placed in the same plane; they may be arranged in straight rows or circles, or in some other easily understood figure — that is in some understandable order.

Illustration

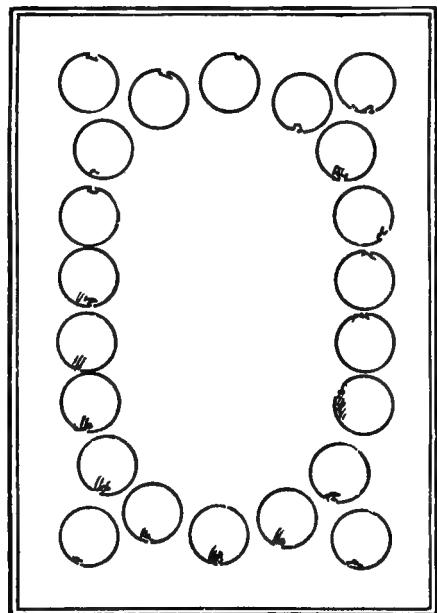
The accompanying diagram may be allowed to represent a public square planted in four different ways. In diagram A the trees are of various species, some deciduous, some evergreens, and



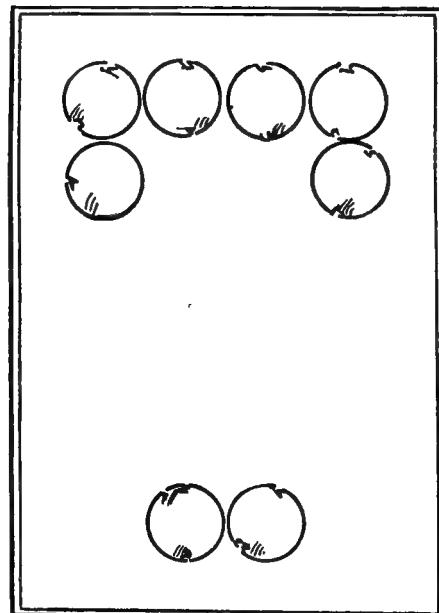
A



B



C



D

FIG. 7. VARIOUS ARRANGEMENTS OF TREES ON A LOT

are scattered aimlessly about over the area. There are very few agreements and no design.

In diagram B the trees are all of the same kind and size and are arranged in straight rows, which rows are parallel with the boundaries of the rectangle. If the student will imagine these four rows of trees, still kept as rows, but placed at various angles with the boundaries, he will see that the difference is very great in favor of the arrangement as shown. In other words the design here illustrated has a larger number of geometrical agreements.

In diagram C an equally definite arrangement has been secured, introducing curved lines. This presents a certain amount of variety, which is in general agreeable.

In diagram D a totally different type of design has been adopted, and one which is very effective in dealing with certain problems.

Observation

It will be noticed that the three designs offered viz. B, C, and D, are all formal in character. This must not be understood as an argument in favor of formal design. It is altogether possible to develop a logical design of informal character, and such design is especially important in landscape architecture. At the same time informal design is much more difficult than formal design; and since the purpose of this present lesson is merely to introduce the idea of design as clearly and simply as possible it is best to adhere to these simple, formal examples.

Problem

The student should plan several other arrangements of trees on the same area here shown.

As a second step in the problem it will be worth while to use two kinds of trees one represented by circles and one by triangles. In order to visualize the results one may consider the circles to represent maples and the triangles to represent spruces.

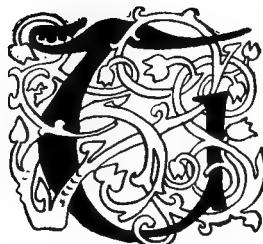
Next the pupil should undertake to make similar arrangements on areas of other sizes and dimensions, some of them irregular in form

Additional Study

The subject of design is of such fundamental importance that the pupil should follow it as far as his time and facilities will allow. There are many good books on design some of which are listed in the bibliography, page 339, and the student should give them extended and careful study.

LESSON 4

BRICK WALK



THE purpose of this lesson is to give the pupil further experience in the simplest problems of design. The problem here presented is the design of a brick walk (or brick and cement) laid in pattern.

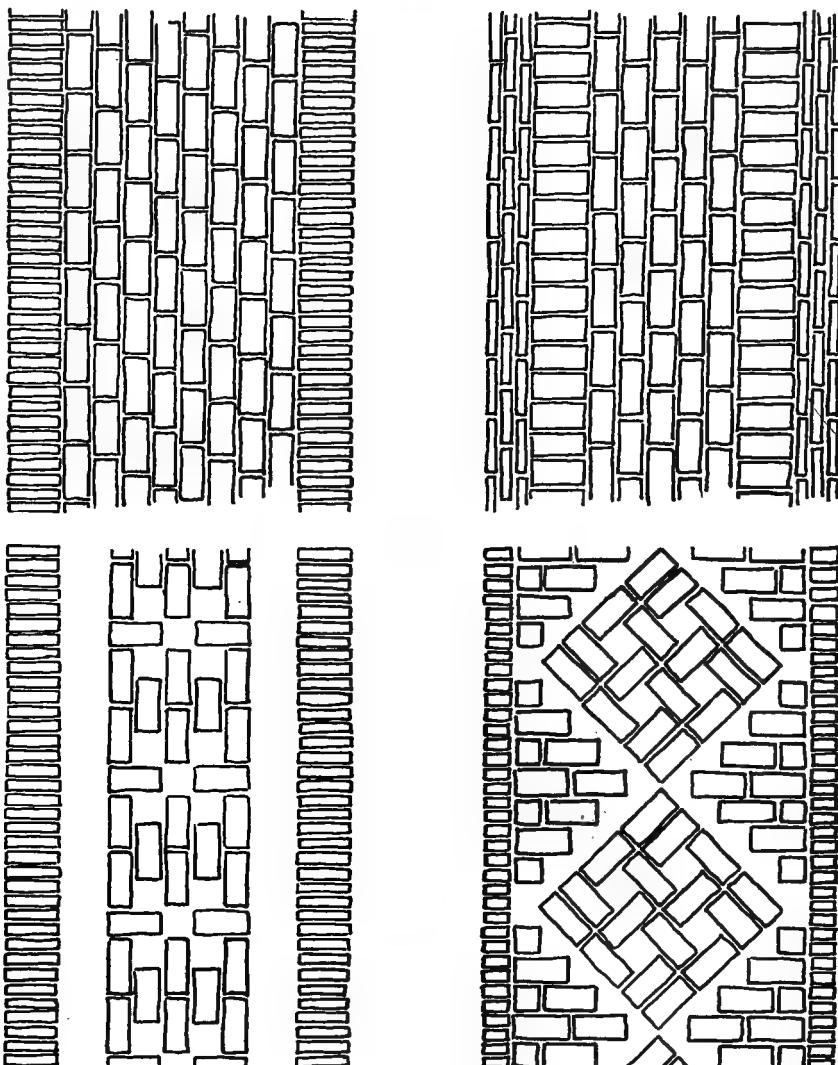
General Considerations

The pattern-work in brick, or brick and cement or brick and tile, is intended to make the walk more interesting and attractive than a walk of plain brick or dull cement. But it must be clearly understood that this enhancing of interest must be kept within bounds. It may be overdone. Brick work of several different colors, or of bright conspicuous colors, may be so gaudy as to attract attention unduly to itself. It is a matter of good taste to draw the distinction between a design which would make a walk agreeably interesting and one which would be disagreeably conspicuous. In matters of taste like this no rules can ever be given.

In general the simpler patterns are to be preferred, and the quietest colorings. If the house is somewhat florid in colored brick, stucco or bright paint, and if there are competing interests, such as fancy gates, brilliant beds of flowers, fountains and other "ornamental" features, then a more fanciful and colorful design may be adopted for the walk.

Examples

In Figure 8 four designs are sketched. In two of these brick alone are used; presumably all of one kind. In the other two brick are combined with cement areas in making up the pattern; and bricks of two different shades may be chosen.



Scale, in, Feet, 0 1 2 3 4 5 6 7 8 9

FIG. 8. DESIGNS FOR WALKS OF BRICK AND CEMENT

B R I C K W A L K

Equipment

For this exercise the pupil will need the usual drawing equipment, such as drawing board, T-square, triangles, scale, with paper and pencils. He ought to have also colored crayons or water colors.



FIG. 9. BRICK WALK WITH FLOWER BORDER

Problems

The student should first redraw one or more of these designs on a larger scale, not less than $1'' = 1'$. These drawings may be made in pencil and colored with crayons.

The student should then make two to four original designs, keeping to the simplest combinations. These designs may be at the same scale. The first ones should be in pencil and colored with

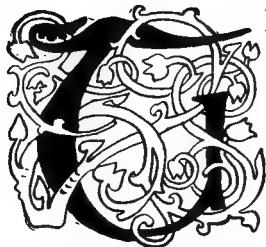
TEXT BOOK OF LANDSCAPE GARDENING

crayons; the later ones should be finished in ink and tinted with water colors.

When this exercise is undertaken by a class it will be very desirable to place all the designs on exhibition together for comparison and criticism.

LESSON 5

SCALING PLANS



HIS lesson is intended to familiarize the pupil with the use of scales in making and reading maps and plans.

Definition

The relation of a distance on a plan to the distance which it represents on the object is called the scale of the plan. Scales are based on the distance in feet on the object which is represented by one inch on the plan or on the number of inches on the plan which represents one foot on the object. In small scale plans an inch represents a considerable distance, often 50, 80, 100 or even several hundred feet. In medium scale plans an inch may represent 10, 20, 30 or 40 feet. In very large scale plans an inch may represent 8 or 4 or 2 or 1 feet or sometimes only a fraction of a foot. Odd scales, such as those in which one inch represents 16 or $16\frac{1}{2}$ or 32 feet etc. are remnants of the old Gunter's or surveyors measure and are now little used, the decimal system being much more convenient.

Applications

Practically all engineers' and landscape gardeners' surveys and plans are made on a scale of one inch representing some multiple of ten feet. The surveys and general plans of large areas are on relatively small scales, the detail plans being usually on a scale of $1'' = 20'$ or $1'' = 40'$. Occasionally plans are made to a scale of $1'' = 10'$ or $1'' = 30'$, but these scales are not so much used.

Architects' plans represent smaller areas and must show more detail than do engineers' plans. They are therefore usually on

much larger scales, from $1'' = 8'$ to $1'' = 1'$, or the details may be drawn 1, 2, 3 or 4 inches on the plan representing one foot on the object, or the plan may even be full size.

A detailed statement of the scale should always be given on a plan. It is usually stated thus — $1'' = 20'$ or "Scale one inch equals twenty feet."

"Graphic scales" are often used. When this is done a straight line is ruled, usually near the title, and divided into lengths equal to one, five, ten, etc. feet at the scale at which the plan is drawn, exactly as the scale of miles is shown on a geographical map. A graphic scale is nearly always to be preferred to a numerical scale, for the following reasons: First the graphic scale makes it possible to take off distances on the edge of a card or paper and measure them on the plan when no other scale is at hand. Second, if the plan shrinks with age, or if it is photographed down to a smaller size for use as an illustration in a book, or for other uses, the graphic scale always holds good, while a statement that one inch represents a definite number of feet would then be incorrect.

Methods of Working

In drawing plans to standard scales, or in reading distances on plans so drawn, the worker should always use a scale made of paper, wood, celluloid or metal. These scales are made in several different patterns and are graduated in the various systems and scales required. The simplest and most useful scale for the student of landscape gardening is the triangular engineer's scale, one foot long, shown in Figure 10. These scales are usually divided to read 10, 20, 30, 40, 50 and 60 parts (or feet) per inch.



FIG. 10. ARCHITECT'S SCALE

The student will inevitably find many plans which do not correspond to any standard scales. Most of the drawings in this book,

SCALING PLANS

though originally made to standard scales, are now "out of scale" because they have been reduced in size in the process of engraving. Any photographic reproduction of a map or plan is likely to change the scale in this manner; and drawings, especially blueprints, often shrink appreciably so as to make the use of the standard scale impracticable.

Whenever such a drawing contains a proper graphic scale it will be easy to read any measurements. If necessary a longer scale can be constructed on a piece of drawing paper by copying and extending the graphic scale. If no graphic scale is given one can still be made providing the true length of any line in the drawing is known or can be ascertained. This known length can then be subdivided and a graphic scale constructed.

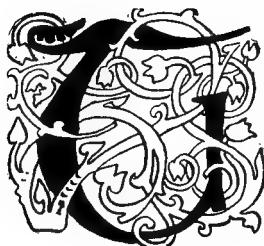
It is important that all these considerations be fully understood by the pupil for they will be found essential in handling the exercises assigned in this book.

Practice

The pupil at this point should have considerable practice in reading distances on plans and maps of all sorts. Besides the numerous examples found in this book he should examine maps in geographies, plans of architects, building and bridge plans in books of all sorts, and should make sure that he can determine quickly and accurately any measurements shown on any legible plan or map

LESSON 6

ENLARGING AND REDUCING PLANS



THE purpose of this lesson is to teach the pupil how to enlarge or reduce plans or maps, that is how to redraw them at a larger or a smaller scale. There are several methods of doing the work, any one of which may be used for either enlarging or reducing. Some of the methods are similar to those used in making surveys, for surveying is simply reducing a plan from full size to some smaller scale.

Cross-Section Method

The plan to be enlarged or reduced is ruled off with two sets of parallel lines at right angles to each other equally spaced, usually at some multiple of five or ten feet apart *at the scale of the plan*. The lines in one direction are numbered and those in the other direction lettered. The sheet on which the enlargement or reduction is to be made is then ruled off in the same way, the lines being spaced relatively the same distance apart, that is the *same number of feet apart at the new scale* and numbered and lettered as on the original plan. The lines and objects of the plan are then drawn in each square in their relative positions, the distances being scaled or estimated depending on the accuracy required. This method is similar to a cross-section survey.

The Radial Method

A transparent paper or cloth is firmly tacked down over the plan so that they will not move on one another. A point, usually somewhat central in location, is then taken from which the distance is measured, at the scale of the original, along a straight line to any

ENLARGING AND REDUCING PLANS

object on the plan beneath. The position of the object is then located on the tracing paper or cloth along the same line and at *relatively* the same distance from the central point *at the new scale*. Instead of changing the scale each time it is often easier to multiply the original reading by the ratio of enlargement or reduction and plot the point without moving the scale. This method is similar to the work done at any one station of a stadia-transit survey or a plane-table survey.

Parallel Courses and Proportional Measurements

In reducing or enlarging a simple rectilinear outline drawing as of a building, field or outline survey, a very easy method is to tack a transparent paper or cloth over the drawing, then starting from some angle draw a line directly over the first side and of the required length at the new scale, draw through its end a line parallel to the second side and measure off the required proportional length. Continue in this way making the corresponding sides of the original and the new drawing parallel and proportional. The last course will coincide with the last course of the original and its farther end will coincide with the starting point. Lines drawn from the starting point through any angle of the new plan will pass through the corresponding angle of the original.

A starting point may be taken and all the work done entirely to one side or within the original so long as all corresponding sides are drawn parallel and proportional. This method of reducing is similar to the use of the plane-table or oriented drawing board in locating a broken line from successive stations. It is merely a little different application of the radial method.

The Pantograph Method

The pantograph is a mechanical device consisting of two pairs of parallel bars so arranged that a pencil mounted on one bar will move in any direction at a definite relation to the motion of a tracer

point mounted on another bar. The ratio of this relation may be varied by adjusting the bars, the pencil and the tracer point to various positions. When the tracer is drawn along the lines of a plan the pencil will reproduce the plan at a proportionately larger or smaller scale. When the pencil describes the larger motion the new plan will be an enlargement but if the pencil and tracer are transposed in position so that the pencil describes the lesser motion the new plan will be a reduction. This method is simply a mechanical application of the radial method, the fixed end of the pantograph bars corresponding to the central point used in that method.

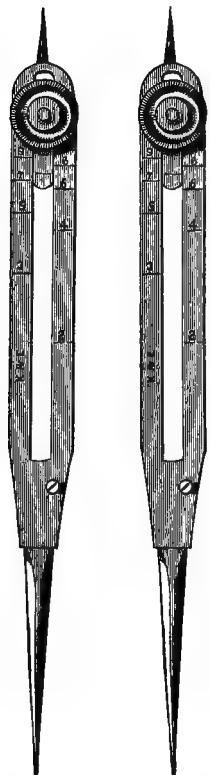


FIG. 11. PROPORTIONAL DIVIDERS

This is a mechanical device having two legs which cross at a movable pivot and open proportionally on opposite sides of it; this proportion may be varied by moving the pivot back or forth along the legs of the instrument. When adjusted so as to give the desired ratio the pivot is clamped in place and measurements taken off the original plan with one end of the instrument are plotted on the new plan with the other end. This is not so much a separate method of enlargement or reduction as it is an instrument which may be made use of in any other method. This method is one of the most practicable of all.

Equipment

For practice in reducing and enlarging the pupil should have several maps and plans of various sizes available. He must have an engineer's scale, with the necessary drawing board, T-square,

ENLARGING AND REDUCING PLANS

triangle, pencil, etc. If the pantograph method is to be illustrated it will be necessary of course to have a pantograph; and a set of proportional dividers will be required in learning method 5 above.

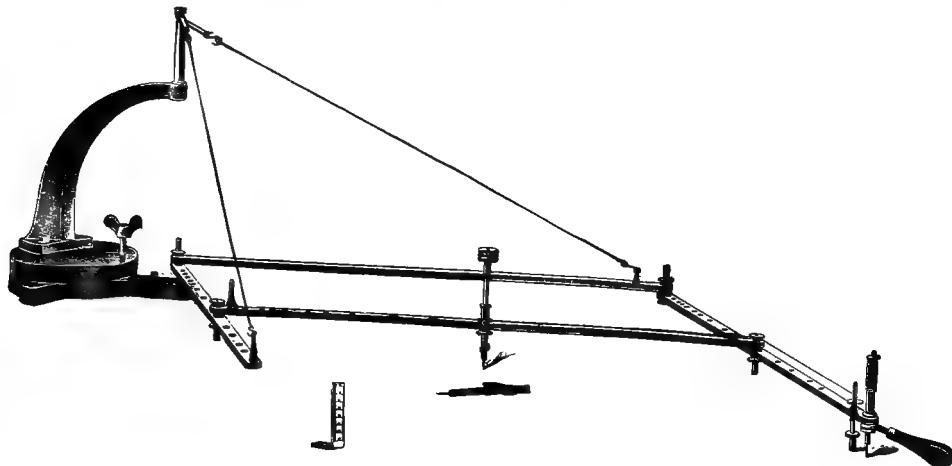


FIG. 12. PANTOGRAPH

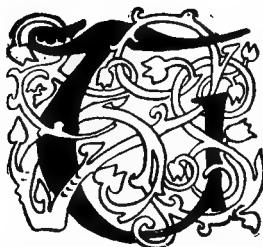
Practice

The student should redraw several maps and plans, reducing some, enlarging others. Plans in this book will serve admirably, as many of them will have to be redrawn by the pupil as the course proceeds.

This practice need not be unduly protracted, since there will be many occasions for the further use of the methods here described, but the pupil should spend enough time in this work so that he can use several different methods readily.

LESSON 7

PACED SURVEY



THE object of this lesson is to explain the usual methods of making paced surveys. Such surveys are frequently used in landscape gardening. It is important that everyone who does any sort of work in landscape gardening, even the pupil in school or college, should be familiar with the practical methods employed and should have some experience in making surveys.

Definition

A paced survey is one in which all, or most of the distances are measured by the worker pacing, or walking, from point to point. Sometimes when large areas are to be mapped as in military work, distances are measured by counting the steps taken by a horse, or by observing the time taken by a horse to traverse them.

Discussion

The paced survey has several practical advantages. It can be made quickly by one man working alone without expensive instruments. It is therefore rapid and inexpensive. Without previous practice the average man will work to about 10% of accuracy, making the distances *too short* on account of over-stepping. With practice it is possible to reduce the error to two or three per cent.

Although not absolutely accurate as to distances the relationships of parts are correct, and such surveys are accurate enough for plans to accompany general directions and explanations to assistants and clients, for rearrangement plans where little grading is proposed, for approximate location of details for the guidance of

experienced foremen, for making planting plans and for records of information in study of existing designs. They are not accurate enough for figuring amounts in grading.

Equipment

The worker should be equipped with a compass (see Lesson 8). He should also have one or several sheets of cross-section paper mounted on a drawing board. It is possible, of course, to make paced surveys while recording the notes on any stray sheet of paper, but the cross-section paper will help greatly. A pair of triangles and an engineer's scale should be used.

General Directions

Pace Length: Do not try to take an unnaturally long step, it is tiresome and cannot be continued with an uniformity. The ordinary step is not far from two and one-half feet, often a little more, and one is apt to lengthen it in pacing so that care should be taken not to overstep. For areas of a few acres the best plan is to take the natural step considering it two and one-half feet and keeping count in *feet* rather than number of steps. Starting with, say, the right foot, counting five, ten, fifteen feet, etc., each time it is placed; distances may then be plotted in feet with the engineer's scale.

When considerable areas are to be surveyed so that long distances are paced and the accumulated error would amount to considerable, more correct results will be obtained by finding the true length of the pace by counting the number taken in a measured distance of considerable length. This is the method used in military surveying. A table of corrections for various slopes may be worked out and applied in order to give correct horizontal distances.

Two methods are in common use:

1. In which objects are located from base lines by two paced distances usually at right angles to each other.
2. In which objects are located from some central point, the

direction being read by a compass and the distance paced. The first method is more useful for areas of a few acres, especially if about a building.

Method I

In this method the plan should be plotted on a piece of paper ruled to squares; engineers cross-section paper is best. It is ruled ten spaces to the inch and each space may be taken as a foot, or as two feet, making the scale of the plan 10' or 20' to the inch, or more if desired. The sides of the main building give good straight lines, and their extensions may easily be located as they cross the grounds. Usually a building will give two such lines in each direction and sometimes more. When there is no building, a straight fence may be used as a base line, or three poles may be set up in line. Three will define the line at any point while if two are used positions on the line cannot be determined between them. A straight line on the ground, as a railroad-edge or ditch will do, but this is not so good as something which stands up so as to be easily seen.

One of the heavy lines on the cross-section paper should be assumed as representing the base line on the ground, or two at right angles should be taken to represent the best defined sides of a building. It will not be possible to locate the details of the building exactly by pacing and if special accuracy is desired for these measurements it will be better to tape them. This may be done by fastening the zero of the tape at one corner of the building and recording the readings at each side of windows, doors, etc., to the next corner, and similarly along the other sides. With this information the building may be easily plotted.

Pacing is not sufficiently accurate to give good results by triangular ties, even small errors in measurement will throw the intersection of the arcs too far from the correct position. The pacing should be on 90° ties, that is along lines at right angles to the base lines. A point should be found in the base line where a line at 90° to it will pass through the object to be located. When the distance to

the object is short such a point may be found by estimation, for greater distances stand on the base line, stretch the arms along it, and (without looking at the object) swing the arms together, if they do not point toward the object move along the base line and try again till the proper place is found. When a drawing board is used to hold the paper, right angles may be found by sighting along its edges or a right angle mirror or prism may be used.

Pacing should be done *from* the point on line *to* the object, as the point must be found first and the object is more easily seen from a distance.

Do not locate an object by pacing from one base line along another to the right angle point, as this would include any error made in the location of the right angle point. Such an error of location would have little effect on a distance at right angles to the base line.

Sometimes objects intervene so that it is not possible to pace along a desired line; it is then often possible with a little care to offset and pace along a parallel line.

Gain general control of the problem first, — that is, locate boundaries, fences, important roads and the larger objects as other buildings, etc., and then fill in the single trees, walks, shrub beds and other details.

Locate everything possible from the original base lines. When objects are to be located from other objects be sure that the first locations are correct.

When locating a line at an angle to the base line tie in its ends, or if more convenient some point in the prolongation of the line. A row of trees may be plotted by locating the end ones and pacing along the line to locate intervening ones.

Locate curves by right angle ties from the base lines to as many points as desired. Avoid unnecessary walking. Often in pacing a distance intermediate objects, as road edges, etc. will be passed; if so, make notes of the distances to such objects and later plot them.

Check your work occasionally by general inspection of the plan and correct any mistakes.

In plotting it will be less confusing to orient the plan so that objects will be in their proper relations.

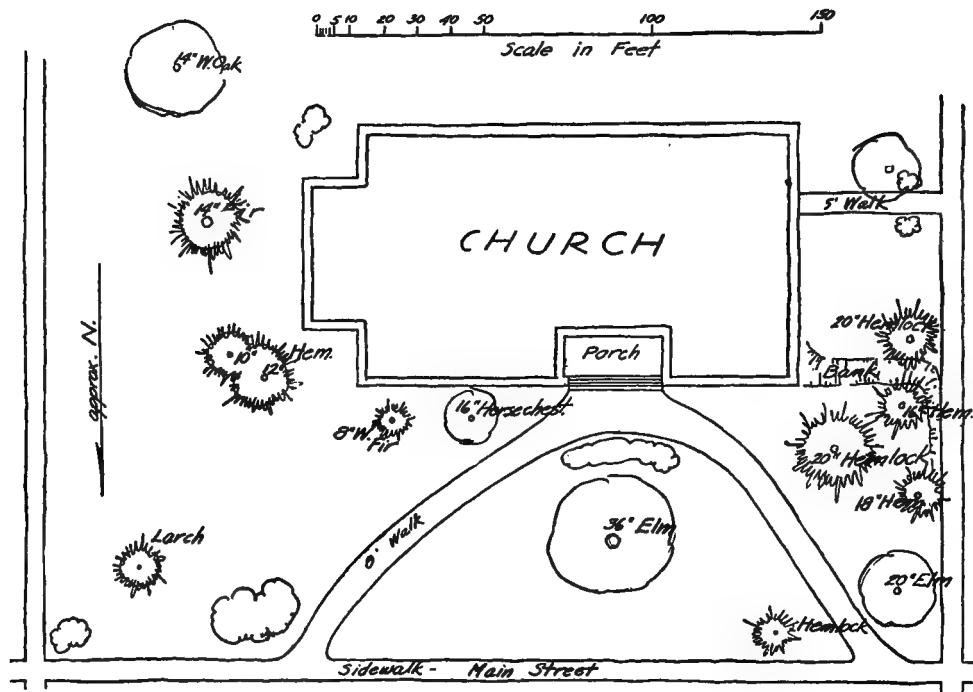


FIG. 13. PLAN DRAWN FROM PACED SURVEY

Omit foliage lines till all location is done and then sketch them by inspection in relation to various objects.

An approximate north point should be shown. It may be determined approximately by holding a watch flat in the hand with its hour hand directed toward the sun (that is with its shadow under it); then half way between the hour hand and twelve will be the north and south line.

Method II

In the second method, where a compass is used, select some central important object such as a tree or building corner, and standing at it, take the bearings of a considerable number of other objects. Then pace from the central station out to an object and crossing over to some other object pace back to the central station so as to save walking. Intermediate objects along a paced line should be noted. The notes of such a survey may be recorded either in tabular form in a notebook with columns showing the station, direction, distance and object, or in a diagrammatic form with the objects roughly sketched in relation and the direction and distance shown along lines from the central station. Additional stations may be located from the first one and the work carried along as required. Such a survey must be plotted up by means of a protractor. It is much better to use a compass and a protractor graduated in azimuth to 360° rather than to quadrants. This method requires less time in the field and more in the office than does the previous one. It also requires the use of compass and protractor. The results are perhaps not quite so accurate, as it is not possible to read courses very accurately with a hand compass.

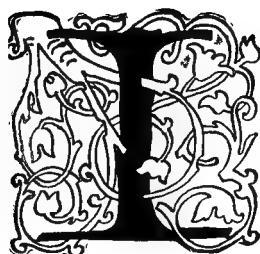
Practice

The student must have actual practice in making paced surveys. Indeed he must have extended and frequent practice. Speed and accuracy are gained by such practice, the improvement in accuracy being especially important.

Therefore let the student undertake surveys of this kind as often as possible. It will be better naturally to begin with simple problems where only a few details are to be located and proceed to the study of larger areas and rougher land with more intricate details. It will be better also to select areas which have some intrinsic interest or those for which the finished maps may be of some further use, either in the present course of landscape gardening studies or for other business.

LESSON 8

USE OF COMPASS



N the simplest paced surveys no compass is used, the cardinal directions being known with sufficient exactness. However, as paced or taped surveys become more elaborate the point is soon reached where directions have to be determined more carefully and horizontal angles read. The use of a hand compass is then the next step.

The present lesson takes up the construction and use of the compass in its simpler forms.

Compass Construction

The essential part of a compass is a magnetized needle balanced on a vertical pivot. This needle when given its freedom will swing horizontally till one end points toward the *magnetic* but not the *true* north.

The ends of the needle are marked in some way to distinguish them; sometimes one end, — usually the north, — is colored blue, sometimes a short transverse bar is placed in the north end, sometimes the south end has a small coil of wire wound around it to balance the dip of the needle. Usually the needle is deeper than wide so as to balance better.

The needle swings within or over a circular dial which is divided into 360 degrees. The unit of graduation is usually one degree, sometimes one-half degree or on small instruments two or five degrees.

The needle oscillates a good deal and comes to rest slowly. In order to check its motion and bring it to rest more quickly a small clamp is usually provided by which the needle may be raised

U S E O F C O M P A S S

from its pivot and clamped against the cover glass. This clamp is usually so arranged as to be brought into action as the case is closed and so lift the needle from its pivot when the instrument is not in use, thus saving the pivot from unnecessary wear and keeping the needle in better condition.

Hand compasses are made in a variety of forms and sizes. The larger ones with longer needles are more carefully made and much better. There are two general kinds:

1. The *Plain, Box* or *Pocket Compass* in which the needle moves within or above a fixed dial all parts of which are open to view. Such instruments are often of watch form and not necessarily shaped like a *box*. They often have folding sight vanes on the N.-S. line; that at the south end with a narrow vertical slit; that at the north end with a vertical hair, thread or wire.

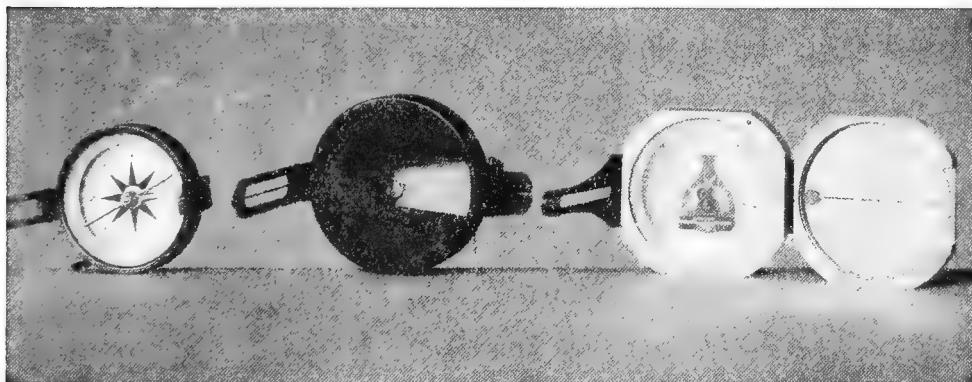


FIG. 14. TYPES OF COMPASSES—BOX COMPASS; PRISMATIC COMPASS; BRUNTON'S POCKET TRANSIT

2. The *Prismatic Compass* in which the dial is attached to and floats with the needle and often only a small part of it is exposed to view. There are usually sight vanes, and on the south one there is a prism so placed as to refract the dial to the eye and make it possible to sight the direction and read the dial at the same time. In another form a mirror in the cover serves the purpose of the prism.

There are several methods of numbering the graduations of the dial. The two methods most often used are:

1. *Quadrant Graduation* with a zero at both the north and south, the numbering increasing in each direction up to 90 degrees at both east and west. Quadrant courses are recorded by their relation to the N.-S. line as N. 10° E. or S. 77° W. etc.

This is the usual form of graduation of the box compass and is the one most often used by land surveyors. It is liable to give rise to confusion and error as there are four different courses for every degree number as N. 10° E., N. 10° W., S. 10° E., S. 10° W., two of the courses being the reverse directions of the other two.

2. *Azimuth Graduations*: In this form there is but one zero which is at the north, the degrees being numbered continuously to the right (clockwise) through E., S. and W. to 360° which coincides with zero at the north.

There is thus but one course for any degree number and therefore less chance for confusion in reading or recording. This is the usual graduation of the prismatic compass.

Important Note: The actual numbering on a floating dial usually starts with zero at the south and runs clockwise but as the reading is always made at the *rear* end of the sighted line in the prismatic compass this arrangement of the numbering gives correct readings based on zero at the north.

It should be carefully noted that with the floating dial we read the direction *on the line of the course* while with a fixed dial we read the direction not *on* the line of the course but *at the N. end of the needle*.

The course is the line through the sight vanes, or if there are no vanes it is along the N.-S. line of the dial which line is brought to bear on the object whose direction is sought.

When the dial floats it brings the reading to the sighted line. When the dial is fixed the instrument revolves about the needle which maintains a constant N.-S. position and the course is shown by the angular distance between it and the N.-S. line of the dial as read

USE OF COMPASS

at the end of the needle. As the course moves to the east the needle *appears* to have moved to the west, and vice versa; for this reason E. and W. are often reversed in position so as to make correct reading easier.

Methods of Use

In use the compass should be held in an approximately horizontal position and as steadily as possible. It is easier to do this if the arms from shoulder to elbow are pressed against the body and any rotation of the compass done by twisting the body rather than by a motion of the wrists.

Some compasses have two small level vials attached at right angles so as to show when the instrument is level; in others the observer must judge by the position or motion of the needle or of the sight vanes whether or not the instrument is nearly level.

The compass needle is easily affected by iron or steel, and care should be taken not to use it near any such metal. Even for approximate hand work it should not be used within 8 or 10 feet of a wire fence or telephone line or 20 or 25 feet of a railroad, while for careful instrument work



FIG. 15. USING THE POCKET TRANSIT

it should be at least 75 feet from a railroad. A large pocket knife will affect the needle if within a foot or so of it.

When possible the instrument may be rested on the top of a post or stick or even on the ground.

If the instrument has sight vanes the N.-S. line should be brought to bear on the object whose direction is desired by holding the instrument nearly up to the level of the eye and sighting through the vanes. When the needle has come to rest it should be carefully clamped and the direction read. The average of two or three readings will be more accurate than a single one.

If there are no sight vanes the instrument must be held at a lower position and the N.-S. line directed by estimation toward the object sought. When the needle has come to rest its direction may be read or the average of the swing may be taken before it comes to rest. It may be helpful in directing the N.-S. line to hold the instrument so that the thumbs meet at S. and the first fingers at N. or to lay a pencil across over the N.-S. line.

The prismatic compass should be held close to the eye and the hands pressed against the face to steady it. Occasional pressure on the stop will bring the needle to rest more quickly or the average swing may be taken rather than to wait for the needle to come to complete rest.

In using the prismatic compass the reading is taken at a fixed point on the compass box on the line of sight near the eye.

In using the box or pocket compass keep the S. point of the dial toward you and always read the N. end of the needle, recording first S. or N. (whichever is nearest the N. end of the needle) then the degrees indicated, then if E. and W. are printed in reversed positions record whichever is nearest the N. end of the needle. If however they are printed in correct positions record the opposite.

When the dial of a box compass is graduated in azimuth clockwise from N. read the N. end of the needle and plot counter-clockwise.

U S E O F C O M P A S S

Records

A record of compass bearings should show the following data, clearly arranged in compact columns:

Starting point	Course	Distance	Object at end of course
N. E. Cor. Wilder “	N. 10° 166°	80 100	12" maple Tree N. W. cor. French

The starting point where the observations are made may be the same for several records.

The course should show first the primary cardinal point N. or S. then the degree, then the secondary cardinal point, E. or W. or simply the degree if the reading is made in azimuth.

The distance in some unit, feet or paces etc., when possible. When an object is located by two courses from two known points the distance is not necessary.

Object at end of course — as definite a description as necessary.

If another person is to plot the notes a statement should be recorded as to what form of an instrument was used and how it was graduated.

Practice

It is essential that the student have considerable practice in handling the compass. In this work practice will give a large increase in accuracy.

If the student can have the use of several compasses of different types it will be desirable to try them all. There are important differences among the compasses in regular use, and each worker usually develops a strong preference for some particular type of instrument. Each type of compass, however, has its uses and advantages, and the good workman will know them all.

For practice purposes it will be found effective to have a number of lines laid out, their true compass bearings being known to the teacher but not to the pupils. The pupils should then read these bearings repeatedly and with all the different makes of compasses available. After thirty or forty readings, which should be recorded, the pupil will see how accurate is his work. He should observe his average error and his limit of error. After one day of attentive practice the student, using any fairly good instrument, should reduce his average error to 2° and his extreme error to 5° .

LESSON 9

COMPASS SURVEY



HE compass survey may be regarded as an improvement upon the simple paced survey, though the compass is frequently used in making paced surveys. In short there are all degrees of accuracy to be attained in surveying depending on the kind of instruments used, the time and attention given to the work and the skill of the surveyor. The student should now endeavor to improve his own work and to gain greater accuracy through the use of the hand compass for determining directions and for measuring horizontal angles.

Measuring Distances

In previous exercises we have assumed that distances would be measured by pacing. Much greater accuracy can be attained by measuring with a surveyor's chain or an engineer's steel tape. The latter is the best measuring instrument for all practical purposes. Some experience in handling the engineer's tape will be found profitable.

"Chain tapes" are thin and fairly broad steel ribbons graduated in feet and hundredths throughout.

Heavy or "Hoop Skirt" tapes are of thicker and usually narrower steel ribbon graduated to feet, and usually the end feet are graduated to tenths.

Be sure you know where the zero point and the total length point are on the tape. If you don't know find out by comparing the ends with some other part of the tape. Some tapes have the zero

at the inside of the ring, some at the end of the ribbon and some at a distance from the end.

In field work it is better to have the zero end at rear so as to measure from it each time. In holding the zero end don't allow



FIG. 16. USING THE PRISMATIC COMPASS

strain to come on the stake or pin. Tie a strong string or leather thong into the ring when more convenient. In making measurements always hold tape level. Hold tape in left hand drawing around little finger. Pull tight, as though you meant business; the shortest measure is the correct one.

Show in your notes the *direction* in which the measurement was made, as from A to B. Record *all* the measurements taken

COMPASS SURVEY

and sum them up to show the total distance between the points thus:—

Distance from A to B	36.22
	44.51
	77.08
	24.40
	182.21.

Complete notes for the survey will then take the following form:

SURVEY OF FARM YARD

May 4, 1922 — T. C. Jones

Station	Course	Distance feet	Description
S. E. Cor. Barn	N. 10° E.	80	12" maple
	S. 14° W.	100	N. E. Cor. Shed

Method of Graphic Record

Another method of recording notes for simple surveys, and a very excellent one within limits, is to make a graphic sketch of the area under survey, and then to measure distances and angles and determine compass bearings on main lines. For example the accompanying sketch, Figure 17, is made by inspection on the ground. After the sketch is made the distances are measured and entered as shown. Compass bearings are also read and entered. This sketch is then taken to the drafting room and correctly plotted to the desired scale.

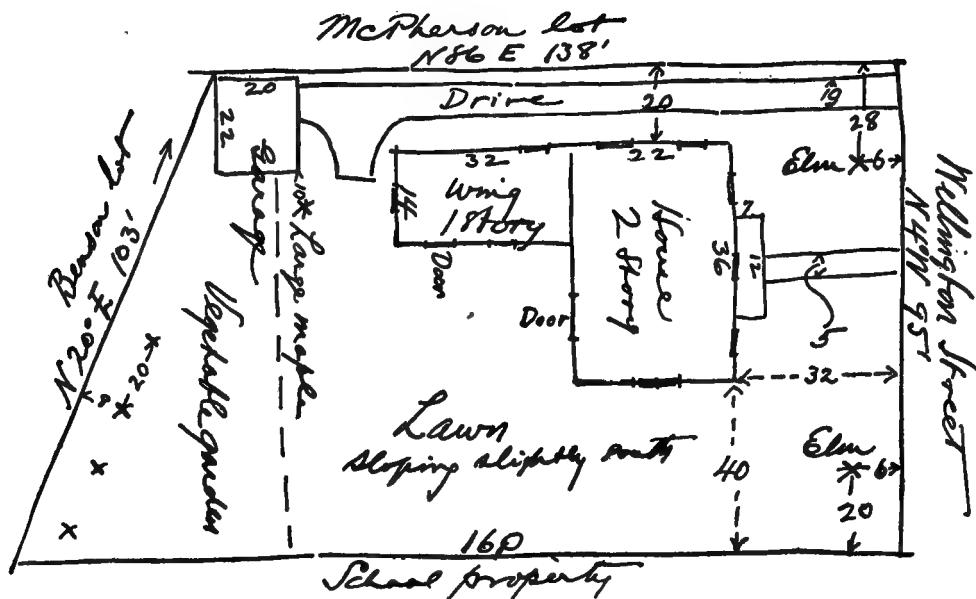


FIG. 17. SURVEY AS SKETCHED IN THE FIELD

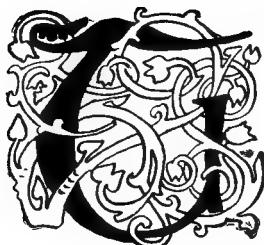
Problems

The student should now make several surveys and finish the maps from his notes. He should practice various methods of surveying and of keeping records. Definite problems should be undertaken, such as the following:

1. Make a compass and pace survey of the nearest school grounds, preparing a finished map in ink.
2. Make a compass and tape-line survey of the nearest railroad station grounds and prepare map.
3. Make paced survey without compass of some neighboring house and lot. The pupil's own home grounds will offer a desirable problem.

LESSON 10

LEVELING



THE student should now learn the simpler methods of leveling, and the present exercise is introduced for this purpose.

Definitions

A *level line* is a line parallel to the surface of a smooth body of water, i.e., parallel to the general surface of the earth. It is therefore a curved line.

A *horizontal line* is a line parallel to the plane of the horizon; or it is a straight line tangent to a level line at any point, that is at right angles to a vertical line.

A *level* is an instrument, with or without a telescope, fixing a line of sight (line of collimation) by means of which differences of elevation may be determined. It will be understood that the line run by a level is not *level* but *horizontal*.

Equipment

For the business now in hand it is not at all necessary to use any elaborate engineering instruments. The farm or drainage level is a very simple instrument, consisting of a cheap telescope (sometimes a tube with glass windows and no lenses) mounted on a light tripod or set up on a jacob-staff. (See Figure 18.)

A hand level is a tube, with or without lenses, in which is mounted a horizontal hair, thus fixing a line of sight. The instrument is held in the hand while making observations.

For all operations which give any reasonable degree of exactness it is necessary to have also a leveling-rod, which is essentially a straight wooden rod usually marked conspicuously in feet, tenths

and hundredths. It is usually desirable further to have a measuring tape or chain.

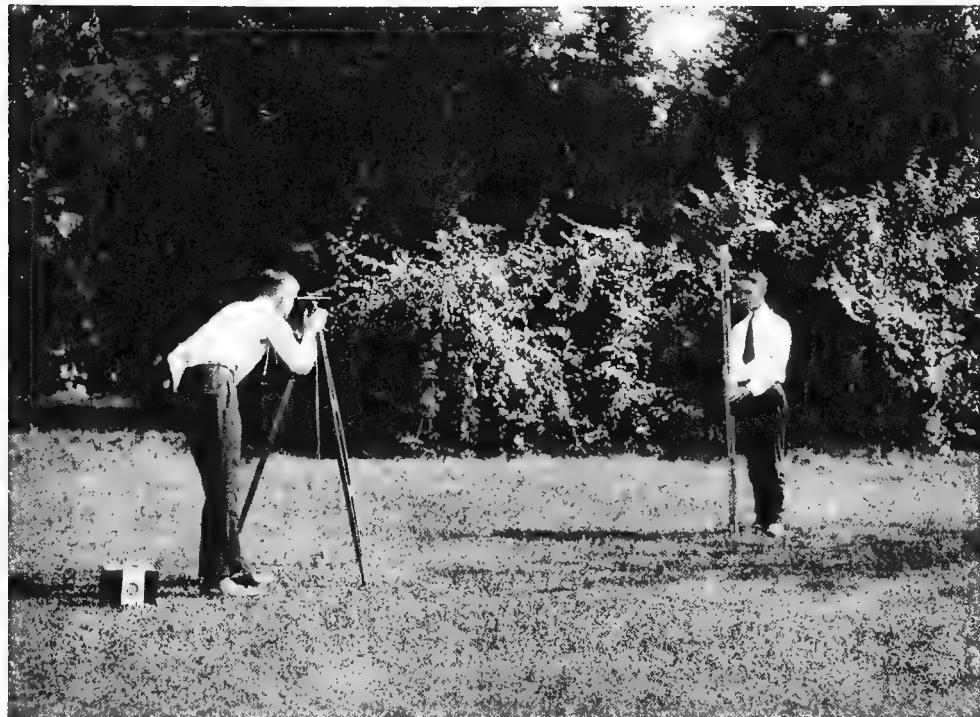


FIG. 18. USING THE FARM LEVEL

Operation

The operation of leveling consists primarily in determining the difference in elevation between two given points. The instrument is set up at some third point from which the two points A and X to be compared are visible. When the level tube has been brought to a horizontal position, the leveling-rod is placed with its zero mark upon the first point, A, the elevation of which is known, and a reading is made. This is called a *back sight*, and the resulting figures tell the height of the telescope tube (line of collimation) above the point A. If this point A is one whose elevation has been deter-

mined with some care with a view to its general use in this survey, it is called a *bench-mark*.

The instrument is now directed toward the second point, X, care being taken to make sure that the instrument tube remains in exactly the same horizontal plane. The leveling-rod is now set up with its zero mark on the point X and the rod is read again. This reading shows the height of the telescope tube above X; but the desired information is secured by subtracting the second reading from the first, the difference thus obtained being the difference of elevation between A and X.

Methods of Leveling

Differential leveling consists in finding the difference of elevation between two or more points in the manner already explained.

Profile leveling consists in taking the elevations of a series of points along a given line. As a matter of convenience only these readings are made at regular intervals, as 10, 50 or 100 feet. The information thus secured is best exhibited when plotted out as a profile. One may thus construct a profile which shows the fall of a stream or the grades, up and down, of a road. See Figure 20.

Cross-section leveling consists in running several profile levels



FIG. 19. USING THE HAND LEVEL

at regular intervals and in two directions, one series at right angles to the other. In practice the lines are leveled out in one direction only. When plotted they are shown by a map cut into squares with elevations shown in figures at each intersection, as in Figure 21.

Contour leveling consists in surveying contours upon the land and mapping them on paper. (For definition of contour see page 51.) This is a useful method but somewhat more complicated. For lack of space it will not be explained here; but the teacher is urged to give the pupil instruction in contour leveling if time and equipment will permit, and especially if plane-table practice can be introduced.

Problems

The student should first become acquainted with the instruments to be used. To this end he should take up several simple problems in differential leveling. He should work in this way until he is sure that he can determine the difference of level between two points with reasonable speed and accuracy.

Profile leveling should then be practiced. Take a section of road, or path, not less than one-quarter nor more than one-half mile in length. Adopt some point as a bench-mark, preferably one the elevation of which is already known. Set up the level and proceed as in profile leveling. Measure from the point of beginning 50 feet along the center of the road and determine the elevation of this second point B. Measure another 50 feet and find the elevation of C. Whenever a point is reached where the leveling-rod cannot be seen from the station where the instrument is standing, or when the elevation is so high or so low that it cannot be read on the leveling-rod, it will be necessary to take up a new station with the instrument. The last point for which the elevation has been determined is then adopted as a *turning-point*. When the instrument has been reset the first operation will be to level back upon this turning-point, and, using this turning-point as a new bench-

LEVELING

mark, compute the elevation of further points with reference to this known elevation.

The information gained in this survey should be instantly recorded in a note-book. From this record a profile should be plotted upon suitable paper upon a drawing board.

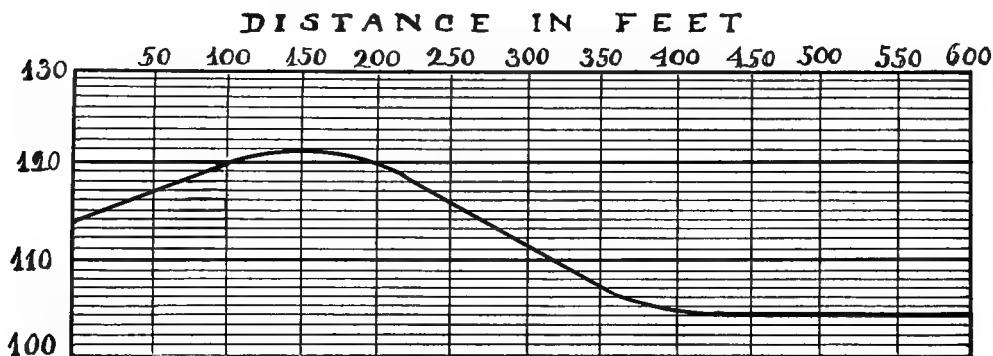


FIG. 20. PROFILE OF A ROAD SECURED BY LEVELING

The student should next undertake one or two simple problems in cross-section surveying. A tract of land of three to ten acres, not too rough and not too level and not too much obstructed with trees or buildings, should be chosen. Along one side a base line should be laid off, pegs being set at intervals of 50 feet. The profile of this line should then be determined with care. Lines perpendicular to this base should next be laid off from the points marked by pegs and running across the area under survey. Then a profile survey will be made on each of these perpendicular lines, beginning at the peg and taking elevation each 50 feet. The observations will all be recorded at once in the field book.

The elevations thus determined should now be shown in figures on a map of squares as in Figure 21.

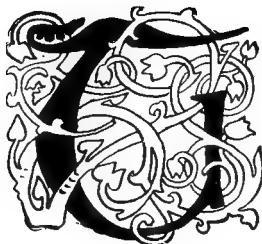
The interpolation of contours will be taken up in the next lesson.

Readings

The student may consult any good manual of surveying, such as Pence and Ketchum, "Manual of Field and Office Methods for the Use of Students in Surveying," New York, 1902.

LESSON 11

MAPPING CONTOURS



HE purpose of this lesson is to teach the meaning and use of contour lines on maps. The pupil must be able to read contours at a glance, and he should be able to draw them correctly upon his own maps.

Definition

A contour is a line upon a plan or map connecting points of equal elevation. The shore line of a body of standing water is a true contour.

Since every part of a contour line is of the same elevation the ground on one side of a contour is always higher and on the other side always lower than the contour. All the elevations between any two contours must be higher than one and lower than the other.

Contours are not necessarily parallel, as the ground surface is very irregular. On steep slopes they are near together, on nearly level land they are far apart and often vary greatly in direction.

A contour can never cross the shore of a body of standing water. A contour may cross the shore of running water but it can cross the same shore *once* only and will then appear on the farther shore at a point nearly opposite.

Contour lines are rarely made up of straight portions joined by relatively sharp angles: they are usually of a series of tangent curves, especially in cleared and cultivated land. At the abrupt edges of artificial cuts or fills or of naturally eroded banks they do have rather sharp angles.

Contours cannot cross each other, except in the very unusual

condition of an overhanging surface, in which case they always cross each other twice.

A contour *never ends*, but we frequently show ends —

1. At the margins of the map — an arbitrary limit beyond which no data are shown.
2. At a building, wall, or other vertical surface — here one or more contours continue *in* the vertical surface but cannot well be shown.
3. At the limits of a ledge, stone pile or other surface so rough that it is difficult to locate the contour correctly on it.
4. At a stream shore, where we have no data to show its location correctly under the water.

Plotting Level Notes

Whenever a series of levels has been taken either with the transit, the plane-table or any kind of a leveling instrument, they should be recorded on the plan in such a way that the decimal point will occupy the exact position where the level was taken.

When the survey has been made by the cross-section method the paper on which the plan is to be plotted should be ruled with two series of fine sharp lines at right angles to each other, properly spaced at the scale of the plan to represent the cross-section lines of the survey. These lines should be lettered and numbered as the survey lines were lettered and numbered in the field. The levels should then be entered diagonally across the intersections of the lines, with the decimal point just where the lines cross.

In working out the positions of the contours on any plan we must base our work on the supposition that the surface of the ground is practically straight — that is on an even slope — between any two adjacent levels. Therefore in taking the levels we must be sure to take them not only at the cross-section stakes, but also wherever there is a change in the slope of the surface, so that our supposition that the surface is on an even slope between the levels will be approximately correct.

MAPPING CONTOURS

The positions of the contours are determined by proportion between any two adjacent levels, thus the 80 contour would pass half way between elevations 79.5 and 80.5 or it would pass through

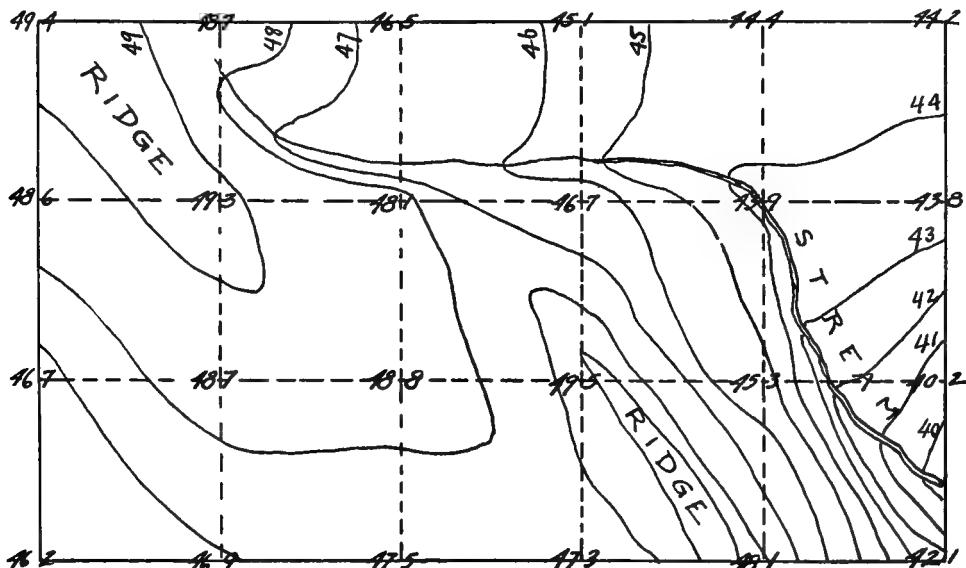


FIG. 21. CONTOURS INTERPOLATED ON CROSS-SECTION SURVEY

a point two-fifths of the way from 79.6 to 80.6. There would be three (one-foot) contours between 24.5 and 27.8 and five between 65.2 and 70.7.

All the contours passing between any two levels should be located at one operation rather than to follow out each contour separately. In interpolating on a cross-section survey it is well to follow along a row of squares rather than to work without any definite order.

Frequently two-foot contours only are interpolated, in which case they should always be the even contours as 70, 72, 74, etc. On small scale plans sometimes the contour interval is five or ten feet as 70, 75, 80, 85 or 70, 80, 90, etc. In any case interpolating is done in the same manner.

Equipment

For practice in reading contours any contour map may be used. The sheets of the United States Geological Survey are especially interesting. The pupil should go over such maps until the form of the land presents itself to his mind quickly and clearly as soon as he sees a set of contour lines, just as ideas come readily from reading a printed page.

For practice in drawing contours the pupil will require the usual drawing equipment, viz., drawing board, T-square, triangles, scales and pencils. He should also have a book of level notes, preferably of his own taking.

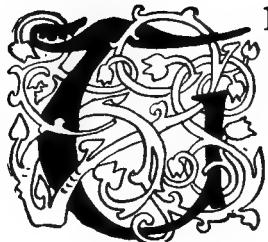
Exercises

Reading exercises may be given at first, but these should be readily understood by the pupil. At any rate the reading of contours will be more easily grasped after the pupil has had some drill in drawing them.

Accordingly several exercises should be assigned in drawing contours on maps of various scales and kinds.

LESSON 12

ENTRANCE ROAD



HIS presents a lesson in drawing and an excellent solution of a typical problem in design frequently encountered in landscape gardening.

Description

The design here given is copied, with very slight changes, from Edourd Andre's "L'Art des Jardins," a famous French work of the past generation. It represents the main entrance to a private estate of considerable importance. The building shown is a "gate lodge," which in its original form was intended to house a guard. There were iron gates in the gateway and no one could be admitted to the grounds without the guard opened the bars. Such pretensions are not popular in America today. On a few estates one will still find a cottage marking the main entrance. It is usually occupied by a gardener or other employee. Even this much is done only on grounds owned by wealthy families more or less Europeanized. It would be impossible to imagine any American farmer closing the front gates on his farm and keeping a hired man to guard the entrance, admitting favorite neighbors and keeping out others.

It seems worth while thus to point out the facts that European customs are different from those of America, that social customs have a very direct influence on landscape gardening and that therefore American landscape gardening is different from that of Europe.

In this plan the gate lodge is surrounded by a small court-yard, which yard is walled in. There is a wall along the front of the estate. Masses of shrubs and deciduous trees mark the entrance and

conceal the interior of the estate. Back of the deciduous trees are five evergreen trees.

Observe that the main road is so designed that it cannot be confused with the secondary or service road. One sometimes sees

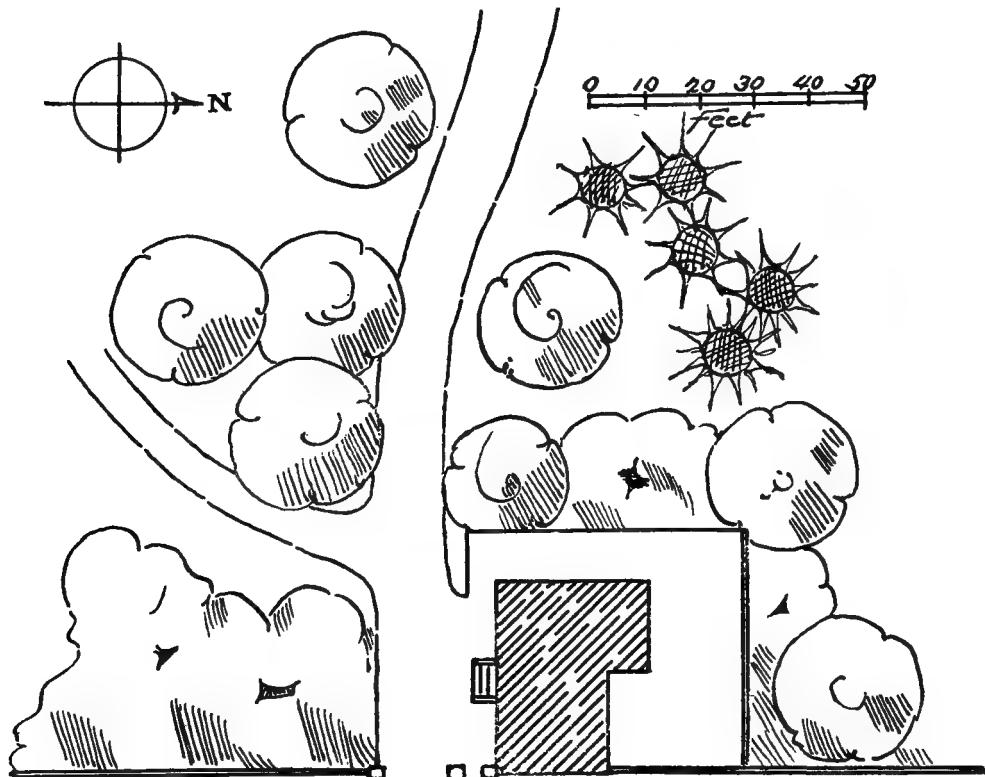


FIG. 22. ENTRANCE TO A PRIVATE ESTATE

signs set up at road junctions reading "This way to the Main Building." Such placards are wholly unnecessary here. The main drive has its character clearly shown (a) by being the more direct — it lies exactly in front of the entering visitor; (b) by being wider than the service drive, and (c) by being on the side toward the gate lodge, the side to which the visitor's attention must necessarily be turned when he enters.

In short this little plan presents an excellent example of struc-

ENTRANCE ROAD

tural design. Every part is placed where it belongs. The skeleton structure of the property is strictly what it ought to be — it conforms exactly to the functions to be performed. It therefore requires no explanations — no sign-board to show the way.

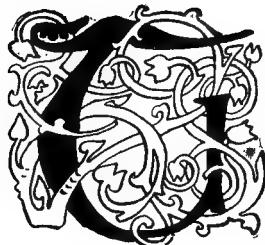
Problem: The pupil should copy this plan at a scale of 1" = 20'.

Supplementary Study

It will be worth while for the pupil to examine the main entrances to a number of estates, public and private, some small, some large. These may include school grounds, college campuses, cemeteries, church grounds and any others available. Try to see whether the present entrance plans are satisfactory. If satisfactory, what are the good points; if unsatisfactory, how could they be improved. It is especially desirable to have each pupil make a measured and scaled plan of some existing entrance area and prepare a new plan. It will be well for all members of a class to take the same problem in this case. When the plans are complete they should be put up together and criticized by the whole class.

LESSON 13

CEMETERY ENTRANCE



HIS lesson is intended to present a simple problem in design. The design is shown both in horizontal plan and perspective.

Illustrations

The plan is taken from a recent German book on suburban gardening.* The conditions represented are typical and such as might be met almost anywhere. The solution is simple, practical and interesting.

Discussion

The land is slightly sloping, being about three feet higher inside the cemetery gate than in the street. The land slopes also somewhat to the left, as will be seen in the perspective drawing.

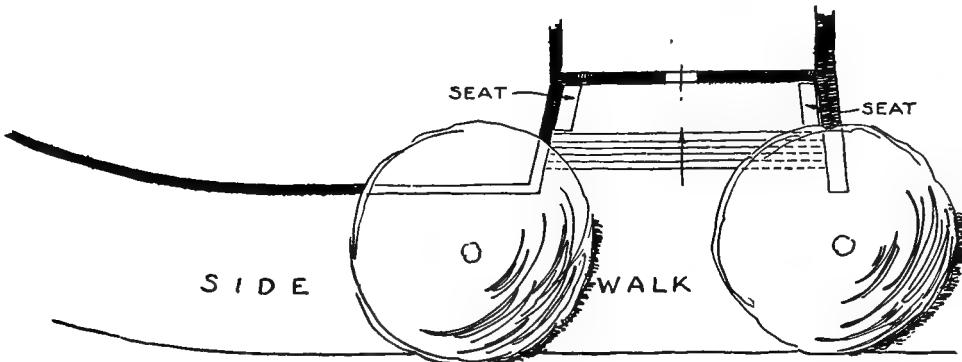
Entrance is made at the corner of the cemetery ground, a very practical arrangement, especially for a foot entrance like this. The entrance is dignified by being recessed from the street, and this effect of breadth and dignity is further enhanced by the broad flight of steps and by the two flanking benches. The two large deciduous trees are a main feature of the picture.

It will be seen that this entrance is not formal, i.e., not symmetrical. It is not on the axis of the entering street. This asymmetrical arrangement is a distinguishing feature of the present design. For the development of a formal design it would be essential that the entrance gate should be on the central axis of the approaching road and that the whole design should be developed

* Lange, Land-und Gartensiedelungen, 88. Leipzig, 1910.

CEMETERY ENTRANCE

symmetrically upon this axis. However if one will now consider the problem of making an attractive photograph of this entrance (that is of determining its pictorial value and its best point of view)



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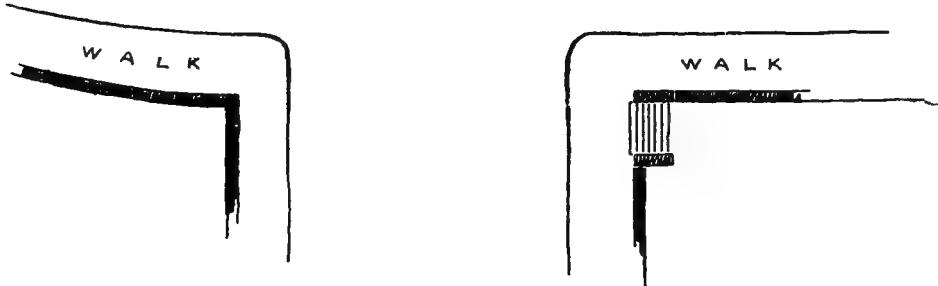


FIG. 23. PLAN OF CEMETERY ENTRANCE

he will soon discover that this entire grouping is more effective when viewed from an angle than when photographed straight in front. This problem thus brings out one of the radical differences between formal and informal design.



FIG. 24. PERSPECTIVE OF CEMETERY ENTRANCE

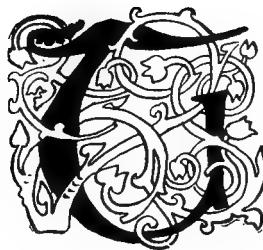
Problems

The student should first reproduce these drawings on a larger scale.

After this has been done and the ideas presented are fully understood, the student should make a study and paced survey of one or more entrance problems upon local parks, cemeteries, playgrounds, church grounds or other available properties. Upon such surveys and studies he should design attractive entrances, using trees, fences, gates, steps, seats and other features as may seem necessary.

LESSON 14

PARK ENTRANCE



HIS lesson offers an opportunity to study a design for a city park entrance. The problem is similar in general character to the two entrance studies already examined; but in this case the entrance being to a larger area, used by a much larger volume of traffic, the treatment is necessarily more elaborate.

Illustration

The example herewith shown is from a design for the main entrance to Lincoln Park, Manitowoc, Wis. The design and drawing are by Mr. F. A. Cushing Smith, landscape architect, Chicago.

The approach is by two streets at right angles to each other, and this condition makes the problem of designing an artistic entrance especially difficult. Mr. Smith has met this condition by developing a monumental feature at the intersection of the two streets. Each street thus terminates definitively upon this monument. The monument moreover becomes the entrance feature of the park, marking the gateway with an object of dignity, beauty and interest. The conservatory is so placed as to emphasize further the terminus of the incoming boulevard and to introduce the park motive, and to add further interest to the entrance area.

Other features of the design are sufficiently explained in the drawing.

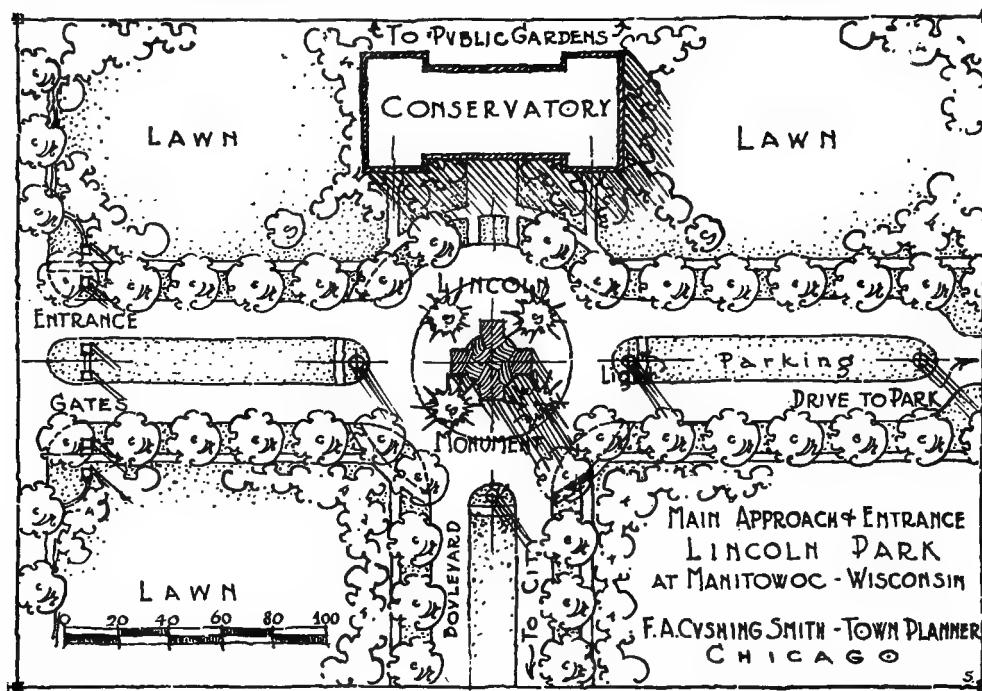


FIG. 25. ENTRANCE TO A PARK

Problems

The sketch plan, Figure 25, should be copied in ink. This is an excellent example of landscape drawing and the technic here shown may be safely imitated by the student.

The student should then work out a design of his own for a park entrance. The entrance to a school or college campus will afford good matter for study. In this case it will be best for all students to work upon the same problem. Drawings should be submitted on a uniform scale. A scale of $1'' = 40'$ will be convenient in most cases. Drawings should all be in the same medium, preferably ink. These drawings should be exhibited together, freely discussed and criticized.

LESSON 15

AUTOMOBILE TURN



THE purpose of this lesson is to illustrate one method of designing an automobile turn and to give the student practice in drafting.

Assignment

Make the cleanest and neatest copy possible of the drawing here shown, Figure 26. Do not trace the drawing — redraw it at a larger scale. A scale of $1'' = 20'$ will usually be convenient.

The new drawing should be made first in pencil, using medium hard lead. It should then be inked. This inking may be made with ruling pen and compass, or it may be made free-hand with a fairly coarse writing pen, as was the original drawing here reproduced. Where drawings are to be used for taking off measurements in construction they should be accurately drawn with ruling pen, but when they are to serve as diagrams merely to illustrate an idea, as in this case, they can be done better by the free-hand method here recommended.

Be careful not to get ink under the edge of the triangle in cross-hatching; be careful to get the cross-hatching even; get a firm, clean outline on the shrubbery masses; make the lines connect without break where the change comes from straight line to arc of circle; be sure that the stippling which represents lawn is made with uniform dots; and that requires that the pen does not drag or scratch.

Discussion

The arrangement here proposed for an automobile turn is easily constructed and is very economical of space. It can be in-

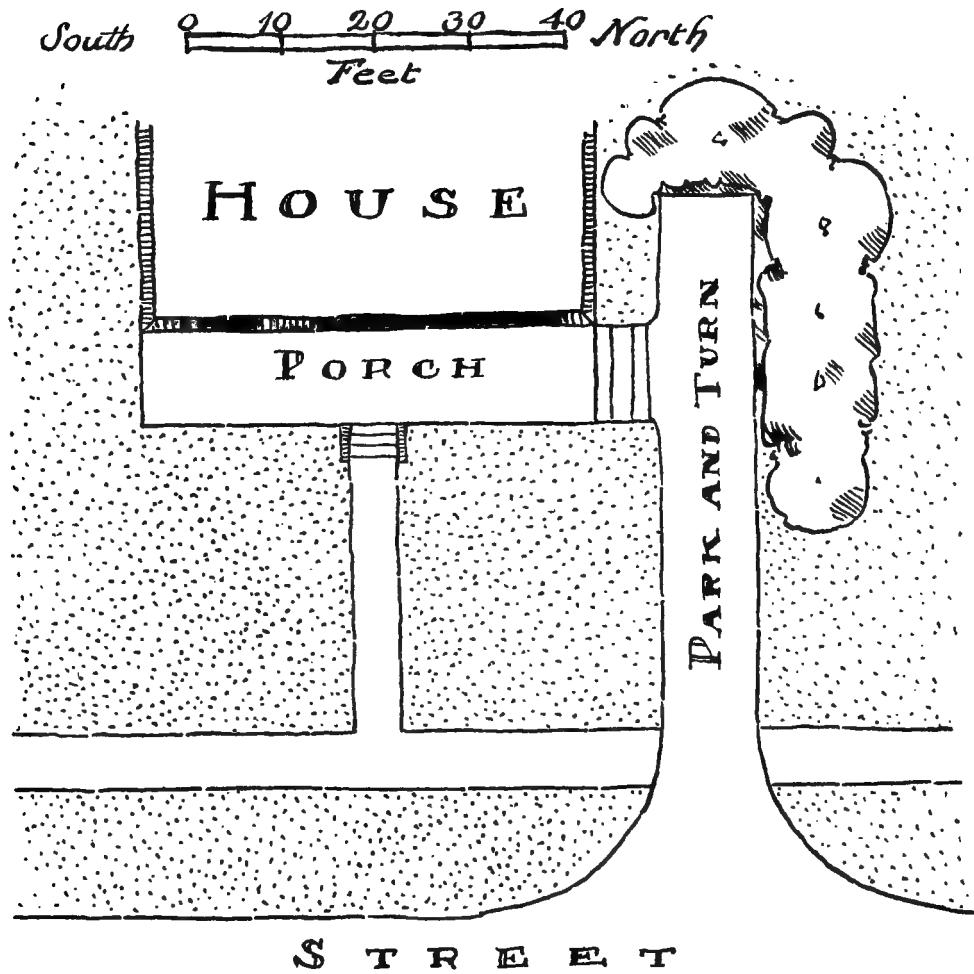


FIG. 26. AUTOMOBILE TURN

troduced in many places where a full circular turn would be impossible. The circular turn, in fact, in its usual form, is always wasteful of space and expensive in construction. Moreover it is unsightly and disfiguring to any private grounds. It is admissible only when introduced in connection with a porte-cochere on a large place or as a formal fore-court before large formal buildings. A complete turn in front of an ordinary residence is an abomination which ought to be avoided at any cost.

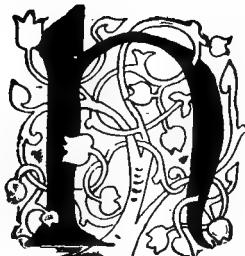
A U T O M O B I L E T U R N

It will be seen that the form of turn here suggested can be used also in front of a garage. The drive could be carried further back and directly into the garage door if desired.

The pupil will find it interesting to make an examination of any good residence street and determine how many home grounds could be best served by an automobile turn and parking space designed after this model.

LESSON 16

CEMETERY LOT



HERE we have presented the problem of the average cemetery lot. This problem recurs with great frequency, but the solutions commonly offered are worked out by everybody except a competent landscape gardener. The student is now asked to consider what the conditions require in the way of clean and orderly treatment.

Discussion

The general conditions in this problem are very well understood, being the same all over North America. Lots are small and are surrounded by other lots all suffering from highly individualistic treatment. Each lot owner does his best, though that best often indicates lack of both imagination and taste. In a few radical cemeteries something has been accomplished by taking the management of lots out of individual hands and referring the whole landscape treatment, including monuments, to some central committee, sometimes placing the matter in the hands of a trained superintendent or landscape gardener.

In general the cemetery lot calls for extreme simplicity, even severity, of treatment. Any fanciful "ornamental" features would be highly incongruous. The necessity for such restraint, though inherent in the individual problem, is much emphasized by the fact that each lot is surrounded by others in which the competition for display and bad taste easily rises to a height which can never be outdone.

Specifically the requirements of the small cemetery lot may be stated as follows:

CEMETERY LOT

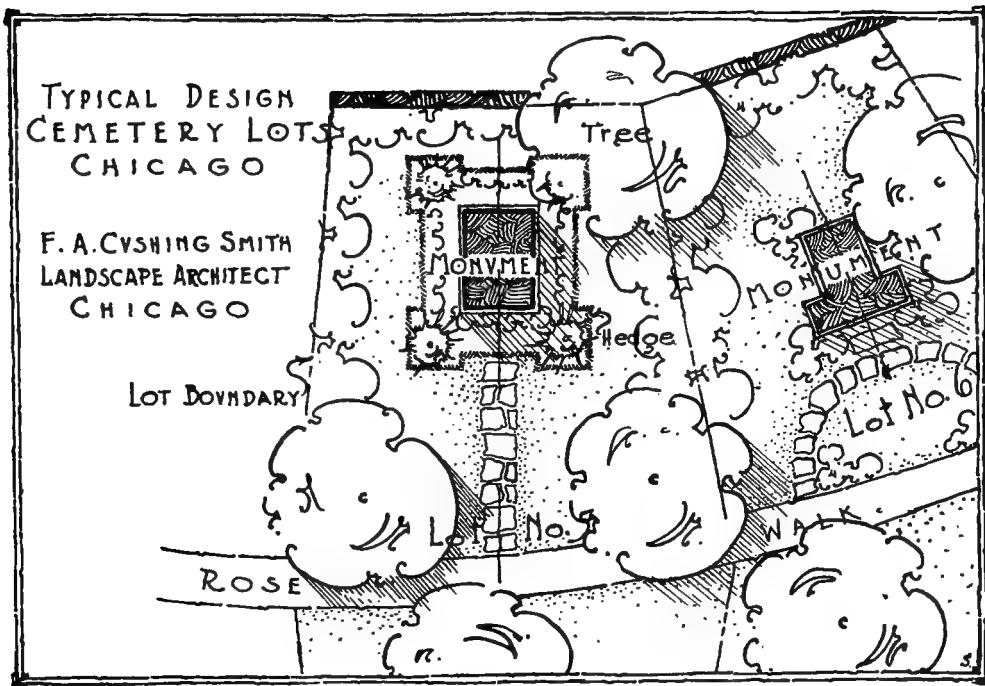


FIG. 27. PROJECT FOR TWO CEMETERY LOTS

The ground should be smooth and level. Mounding, banking or terracing is inadmissible, unless very exceptional conditions have to be met.

The ground should be in grass, and the grass should be kept mowed. There are, of course, exceptions to this rule also, but they are genuine exceptions.

The monuments, head-stones and foot-stones should be as few as possible; and each one should be as small, simple and inconspicuous as it can be made.

All these furnishings should be kept in repair; they should always stand plumb.

Other furnishings, such as iron fences, iron garden seats, etc., should be omitted.

Deciduous trees, with their quiet shadows upon the mown lawns, make the ideal plantings for cemeteries. While it is imprac-

ticable for each lot to have one large oak or beech, a few large trees, properly placed and grouped, will do more to dignify any section of any cemetery than anything else which can be planted. There is a custom too common in this country of planting evergreens and weeping trees in cemeteries. Neither one has anything to recommend it.



FIG. 28. APPROPRIATE TREATMENT OF CEMETERY LOT

Flowering shrubs, such as roses, lilacs and spireas are sometimes planted on private lots. They may be managed in a way to make them agreeable, or at least unobjectionable, but they must be introduced with great care.

Beds of flowers, such as cannas, geraniums or heliotrope, are always objectionable.

CEMETERY LOT

Clipped hedges of buckthorn, privet or evergreen species may rarely be used.

Illustration

In the sketch, Figure 27, the treatment for two typical cemetery lots is suggested by Mr. F. A. Cushing Smith, landscape architect, Chicago, Ill. These show free use of deciduous shade trees supported by informal plantings of hardy shrubs. These are arranged so as to make sketchy boundaries for each lot, giving a little touch of privacy. The monument on Lot No. 5 is set off with a small clipped formal evergreen at each corner with a small border planting between, perhaps of ivy, periwinkle or pachysandra. An interesting note is struck by using flat irregular stepping stones in the grass.

Problem

The student should now measure some cemetery lot with which he is acquainted and should prepare a plan for its permanent improvement. This plan should be made in ink at a scale of $1'' = 1'$. The plans of all members of the class should be compared and criticized.

Questions

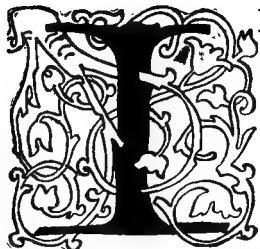
What are the dimensions of the average cemetery lot? Could these be larger, and would larger lots be advisable?

What defects of treatment are most frequent in individual cemetery lots within your observation?

What is meant by "perpetual care" in cemetery management? How is it effected? and what should it cost?

LESSON 17

STREET CROSS-SECTIONS



N order to understand the problems of road improvement it is important to have a detailed knowledge of road design. These details are more numerous, more intricate and more significant than the average person supposes. The present study should introduce the pupil to some of these data, especially those which concern the plan of the public highway and the arrangement of its furnishings.

Materials

The principal studies should be made upon existing roads and streets in the vicinity of the school. A tape line or engineer's chain will be needed to make measurements. These findings should be supplemented by readings suggested at the end of this lesson.

Procedure

Each pupil should make a detailed measurement of cross-sections on two or three streets of different types — country roads, residence streets, business streets, etc. These measurements should run from property line to property line and should locate precisely all features, such as sidewalks, trees, curbs, gutters, drains, paving, etc. This information should be drawn out in the form shown herewith (Figure 29). All sections should be drawn to the same scale in order to facilitate comparison. A scale of $1'' = 10'$ will usually serve.

After these drawings have been made for a considerable number

STREET CROSS-SECTIONS

of cross-sections, they should be pinned up together on the display board for comparison and study.

STANDARD STREET SECTIONS

U. S. Housing Corporation

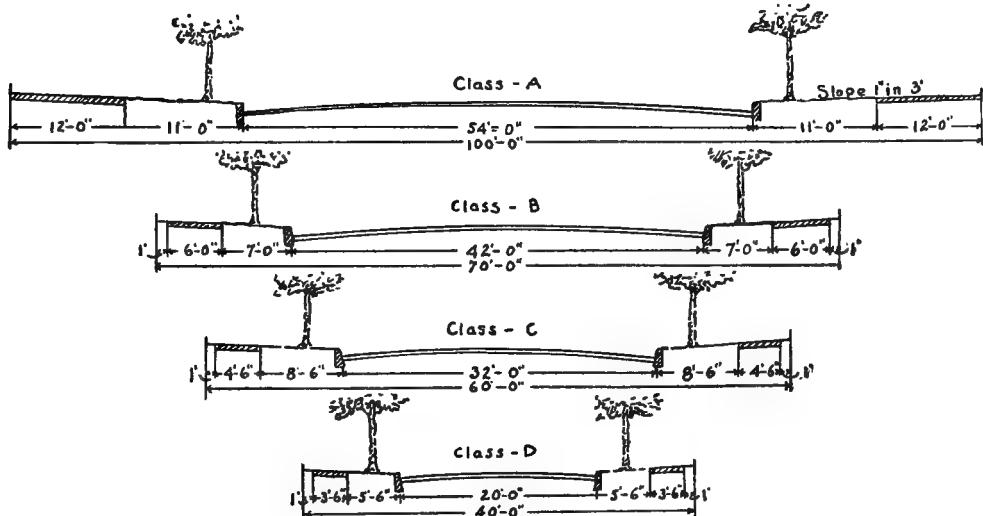


FIG. 29. STREET SECTIONS. Adopted by U. S. Housing Corporation

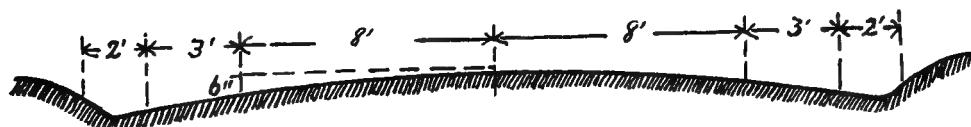


FIG. 30. CONNECTICUT STATE ROADS—STANDARD CROSS-SECTION

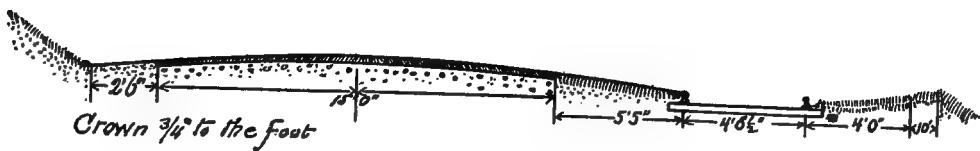


FIG. 31. MASSACHUSETTS STATE HIGHWAYS STANDARD CROSS-SECTION

Study

The cross-sections shown in the accompanying figure were those adopted as standard by the United States Housing Corporation for the extensive town planning operations carried on during the World

War. They may be regarded as an expression of the very best judgment possible upon the needs of American residence districts.

Herewith are given also (Figure 31) the details of cross-section for Massachusetts state roads. These represent country road requirements, but the measurements do not run from property line to property line, and so do not include certain elements of importance even in county highways.



FIG. 32. WIDE STREET WITH DOUBLE ROW OF TREES AT CENTER—COLORADO SPRINGS

The following general observations may be noted:

1. The right of way is often needlessly wide in American cities and villages and in the country. In the government survey districts of the Middle West and elsewhere the public right of way is four rods, sixty-six feet wide, though one-half that space is ample for all road purposes.

STREET CROSS-SECTIONS

2. The paved or improved portion of the roadbed is often needlessly wide. It should be just wide enough to carry the traffic and no wider.



FIG. 33. BROAD STREET WITH CENTRAL PARKING SPACE—COLORADO SPRINGS

3. The sidewalk is best placed on the outer edge of the street, the outer edge of the sidewalk coinciding with the property line.

4. The sidewalk should be well made and no wider than necessary.

5. Trees should be planted between the sidewalk and the roadway.

6. Service wires of all sorts should be kept out of the streets as much as possible. At the present time too much leniency is shown toward these intrusions, always detrimental to the streets.

7. The roadway should be well built and capable of carrying the traffic.

8. The entire highway should be clean and orderly. It should not be filled with weeds. However native growth of trees, shrubs and wild flowers may be permissible and desirable in country roads when properly disposed.

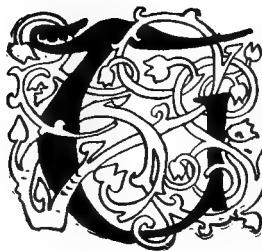
Query: Where are the best sections of road or street in your neighborhood? Consider in detail what merits these sections exhibit.

Readings

ROBINSON, *City Planning, New York, 1916.*

LESSON 18

STREETS — GENERAL STUDY



THE pupil should have reached the point now where he can quickly take a comprehensive view of any street and be able to judge its good points and its deficiencies with promptness and accuracy. The purpose now is to make such critical studies of a number of streets of different types.

Materials

These studies may be made upon streets in the neighborhood; but if it is possible for pupils to extend these examinations to country districts, towns and cities at some distance from home the information gained will be quite as valuable and even more interesting. Preceding studies should have made the pupils sufficiently familiar with near-by streets.

For the purposes of this study it will be desirable, though not necessary, to provide each pupil with a number of blank forms as shown below. One of these forms should be filled out for each street examined.

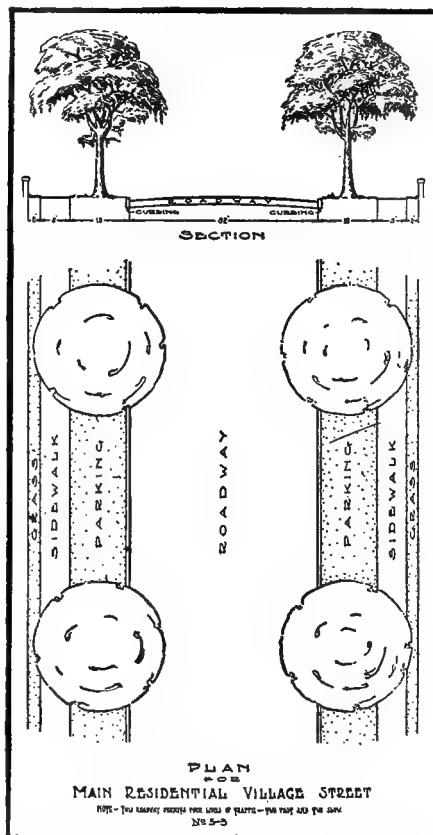


FIG. 34. PLAN FOR RESIDENCE STREET
IN A VILLAGE

FORM A

Study of Streets

A. EQUIPMENT

Road bed: Character (earth, gravel, macadam), good or bad?

Gutters: How deep? Are they too deep? Are they properly formed?
— of what material?

Curb: What material? good or bad?

Sidewalks: Width, material, location.

Parkings: (including grass) width, condition.

Fences: Present or absent; good or bad; are they needed?

Bridges: Kind; quality.

Culverts: Kind; quality; are others needed?

Catchbasins: Present? Are they needed?

Street Signs: Present? Are they needed?

B. PUBLIC SERVICE

Poles: Kind; how many? good or bad? Are they indispensable?

Wires: Kind; how many? Are they dangerous? Are they indispensable?

Car lines: Number and kind; are they necessary?

Sewerage: Present? O.K.?

Gas: Present? O.K.?

Water: (including hydrants) Present? O.K.?

Mail boxes: Present? O.K.?

Fire alarms: Police alarm; present? O.K.?

C. ORNAMENT

Trees: Kinds; age; condition.

Shrubs: Kinds; condition; are shrubs needed?

D. NUISANCES

Dumps: Whose?

Bill boards: Why?

Weeds: What kind?

Report on Street

By Date

Procedure

As soon as these studies have been made they should be assembled, compared and criticized. It will be practicable to have the pupils answer such questions as the following:

1. What is the best type of street paving for this locality?
2. What are the comparative merits of gravel, macadam, concrete?
3. What should be the cost of street construction of different types? What should be the normal cost of street maintenance?
4. Where have you found the best parkings? best plantings? best curbs? best culverts? best bridges? best street signs? etc. etc.

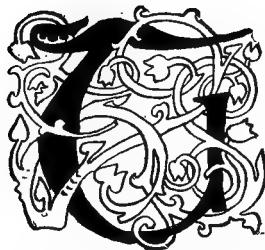
The teacher should be able to extend the list of such questions considerably so as to cover matters of special interest to his students and to his locality.

It may seem worth while, if time permits, to construct and use a score card upon the roads in the neighborhood. The construction of such a score card is a problem which may well be assigned to the class itself.

An exhibit of photographs of streets, street plantings, street furnishings, etc., may be prepared by the class. Hundreds of post-cards, for example, can be gathered showing streets in all parts of the world. These can be studied, compared and criticized to the full limit of available time.

LESSON 19

STREET TREES — VARIETIES



HE object of this lesson is to familiarize the pupil with the different kinds of street trees growing in his vicinity. The number of species is probably small, and the pupil should be able easily to learn all that are of any importance. He should learn their appearance in summer and winter, their principal characteristics, their specific advantages and defects.

Materials

Altogether the most valuable studies can be made from the trees themselves. Books or bulletins should be used only rarely for identification or to verify names. Use scientific names only when the vernacular names are untrustworthy.

Procedure

Each pupil should be assigned a considerable territory for examination — not less than one mile and not more than two miles of city or village street on which trees are growing. If some of these are old trees and some sections newly planted, so much the better. Each pupil should then proceed to make a detailed examination of the streets assigned.

First of all he should make a simple inventory by species. This can be noted on a check-list, in this form:

American elm	1111	1111	1111	1111	1111	1111	1111
Sugar maple	1111	1111	1111	1111	1		
Soft (silver) maple	1111	1111	1111	1111	1111	1111	1111
Horse chestnut	1111	1111					
Catalpa	1111	11					
Etc.							



FIG. 35. PIN OAKS IN WINTER



FIG. 36. PALMETTOES ON A STREET IN SAVANNAH

When all pupils report their inventories should be summarized and reduced to percentages. Such a summary will indicate the relative popularity of the several species used as street trees; and this popularity, with some exceptions, is a fair index of the usefulness of the different species.



FIG. 37. LIVE OAK IN SAVANNAH

Questions

What species are overplanted? and what species might well be more generally planted? This inquiry involves a searching criticism of the foregoing findings, and this discussion should be given ample time in class.

In the field examination, however, the pupil should collect other information beyond the mere census of trees. He should

STREET TREES—VARIETIES

particularly try to answer the following questions regarding each species:

1. What are its outstanding characteristics?
2. What are its good points?
3. What are its defects?
4. For what conditions is it particularly adapted?

The note-book should then contain, at the end of this study, a series of entries in the following form:

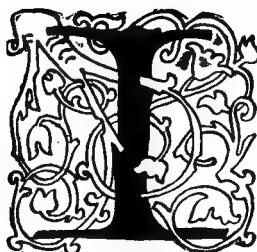
Street Trees — American elm — Tall, spreading, vase-form, branches high, leaving tall clean trunk; varies much in form; hardy, withstands wind and drouth; foliage good; adapted to city and village streets where plenty of room is available.

Street Trees — Catalpa — Small, and rather irregular, low bushy top, hardy, not subject to insect attacks, has fine flowers; short lived and poor shade; suitable for narrow streets and hard conditions where better trees cannot be grown.

These reports should, of course, be read and criticized in class.

LESSON 20

STREET TREES — TECHNICAL STUDIES



N this study the pupil should master the practical or technical details which are essential in order to enable him to manage street trees and get the best results.

Materials

The study should be conducted in the field upon street trees of the neighborhood. There are many books and bulletins dealing with the care of trees, pruning, spraying, so-called tree surgery, city forestry, etc. Some of these books are listed amongst the reference readings below. They should be studied as fully as time permits, but the first and most important step in the work is to become acquainted with the trees themselves and with the conditions under which they live.

Study

Each pupil should be assigned to a certain section planted with street trees. This should be the equivalent of not less than two city blocks nor more than one half mile. On this space he should gather all possible information, such as that suggested below:

1. What is the character of the street under study — country road, village residence section, business street, or what?
2. To what extent is the street traversed by electric car lines, electric service wires, telephone wires, gas mains, water mains, sewers, etc.?
3. What is the character of the soil?
4. What other conditions have any effect on the growth or health of trees?

Cultural conditions should then be examined in detail.

1. How far apart are the trees planted?
2. Is the alignment exact? If there are deviations from strict alignment why have they been made? and what is the result?
3. Where are the trees placed with reference to sidewalk, curb, pavement? Is there ample space for trees to grow?



FIG. 38. GOOD LOCATION OF SIDEWALK AND OTHER DETAILS

4. Have the trees been pruned? How? Is the pruning satisfactory?
5. Have tree guards been used? Are they needed? Are they satisfactory?
6. How many trees have broken tops? Due to ice storms or other causes?
7. How many trees show injury to trunk from gnawing horses or similar causes?

8. How many trees show burning or similar injury from electric wires?
9. How many trees show gas poison? (It may be necessary to read up on the symptoms of this disease.)
10. List any other defects.

It will probably be found that a very large percentage of street trees are defective in one way or another. In fact there are many sections where hardly a perfect tree can be found. When the reports of all members of the class are brought together and summarized they should show the number of instances of ice damage, horse damage, gas, poison, electric line injury, etc. This will indicate pretty clearly what causes pull down the average health of trees, and thus suggest where effort should be directed toward improving conditions.

Other matters which may be investigated if there is time are drainage, irrigation, fertilization, spraying and laws for the protection of trees.

References

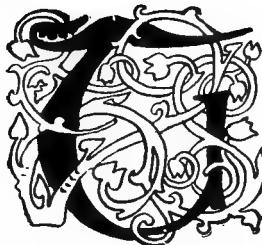
SOLOTAROFF, Shade-trees in Towns and Cities, *New York*, 1911.

PEETS, Practical Tree Repair, *New York*, 1916.

MULFORD, Planting and Care of Street Trees, U. S. Dept. Agr., Farmers' Bul. 1209, Aug. 1921.

LESSON 21

STREET TREES — RESULTS



HE object of this exercise is to find and to enjoy the best street trees within reach. Every pupil must look for the finest trees and must use his own taste in deciding which trees are really best. This exercise of taste (as we call judgment in reference to beauty) is an exceedingly important practice for the pupil. It will never do always to take some one else's word for what is the best literature, what is good music or which are the most beautiful trees. The pupil's own taste must be trained by exercise, and must eventually be satisfied with results.

Another characteristic and important feature of this lesson is the search for what is best. The pupil is not asked to find the worst specimens, nor to make any comparison between best and worst. One should always seek to see the best and should pay the least possible attention to the worst. This attitude of mind is essential to art and is to be recommended in all departments of life. (For good scriptural support read Paul in Philippians 4 : 8.)

Procedure

Each pupil is directed to examine all street trees within reach and to answer in writing the following questions:

1. Where is the best block of street trees in the town (city or other area under study)?
2. What species are they?
3. How old are they?
4. How far apart are they spaced? How large are they?

Give any interesting facts concerning them.

5. Where is the best single specimen in any street in the town?
6. What species is it? How old is it? Give any other interesting information. If possible photographs of good street plantings and good individual trees should be submitted.



FIG. 39. THE ARCHING AMERICAN ELMS

Discussion

All these reports should come up for full discussion before the assembled class. Should any difference of opinion develop as to which trees are to be judged best these competitive cases should be

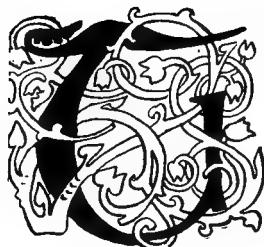
S T R E E T T R E E S — R E S U L T S

examined with care. It is by no means necessary that a positive decision be reached as to which is best; but it is of the utmost value that each pupil should put his own preferences to the stringent test of argument.

If a number of photographs can be collected for an exhibit these will assist in clarifying everybody's ideas.

LESSON 22

BASE-BALL FIELD



THE problem in this lesson is that of laying off a standard base-ball field.

Discussion

The landscape gardener is often called upon to lay off athletic fields or game courts of various kinds. He should have at his command full information regarding the standard dimensions, and the fullest possible knowledge of general requirements.

The standard base-ball diamond is made in the form of a square exactly 90 feet on a side with a distance of 60 feet 6 inches from pitcher's mound to home base. In playgrounds for children it is customary to lay off what is known as a boy's diamond 60 feet square.

Besides the diamond itself the regular base-ball field includes other features such as the coach line, players' line and clear space for back-field and out-field as shown in the drawing.

Illustration

The drawing, Figure 40, shows the layout of the standard base-ball field. The dimensions instead of being read from a scale are shown in figures on the drawing. This method of expressing measurements is frequently used in architectural and mechanical drawings, though rarely employed in the maps of engineers and landscape gardeners.

BASE-BALL FIELD

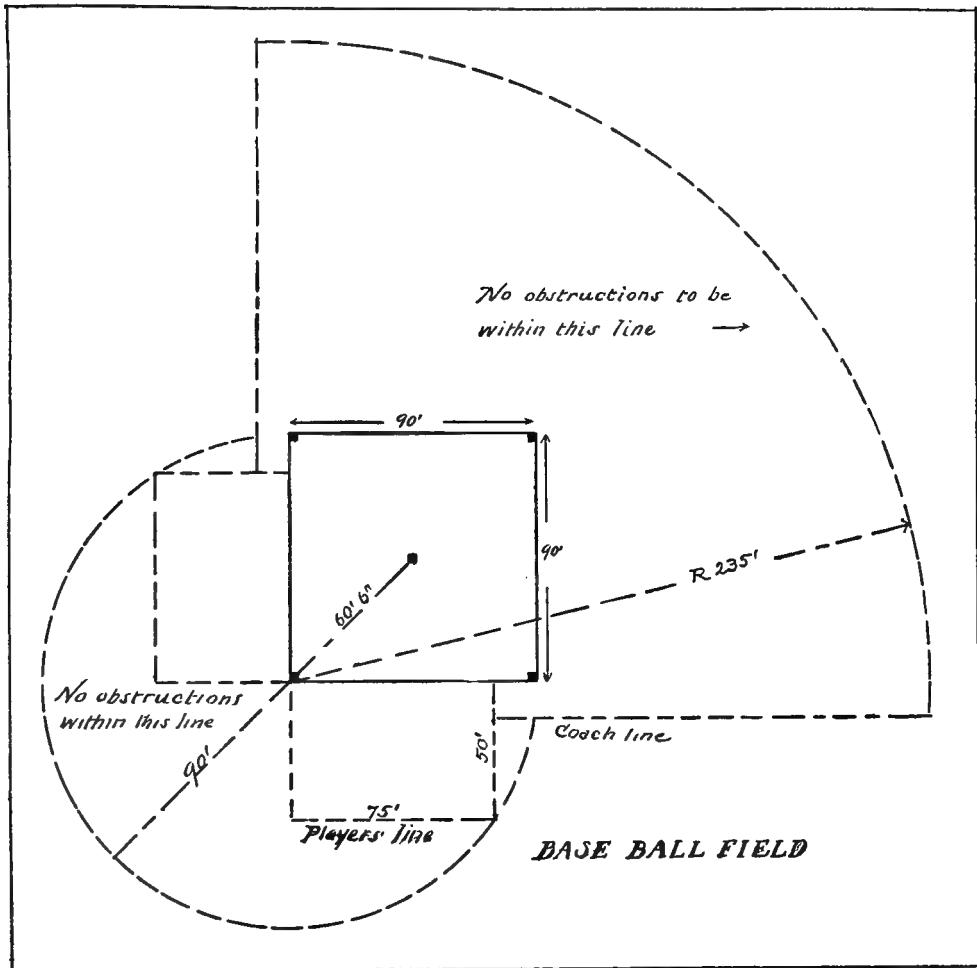


FIG. 40. STANDARD BASE-BALL FIELD

Assignments

The pupil should make a drawing of the standard base-ball diamond for preservation in his own note-book. This should be made in ink at a convenient scale, say $1'' = 10'$.

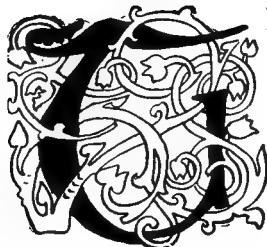
It will then prove a valuable exercise if the student, or group of students, can lay out an actual base-ball diamond on a piece of suitable land.

Questions

1. How many acres of land will be required to lay out a good base-ball field?
2. What orientation is most desirable?

LESSON 23

TENNIS COURT



THE problem presented in this lesson is the layout of the standard tennis court.

Discussion

The general requirements of a tennis court are commonly understood. They need not be taken up here. Neither is it necessary at this time to enter into any discussion of the practical construction of a court.

Every landscape gardener however is frequently required to lay out tennis courts. He should have at hand full information

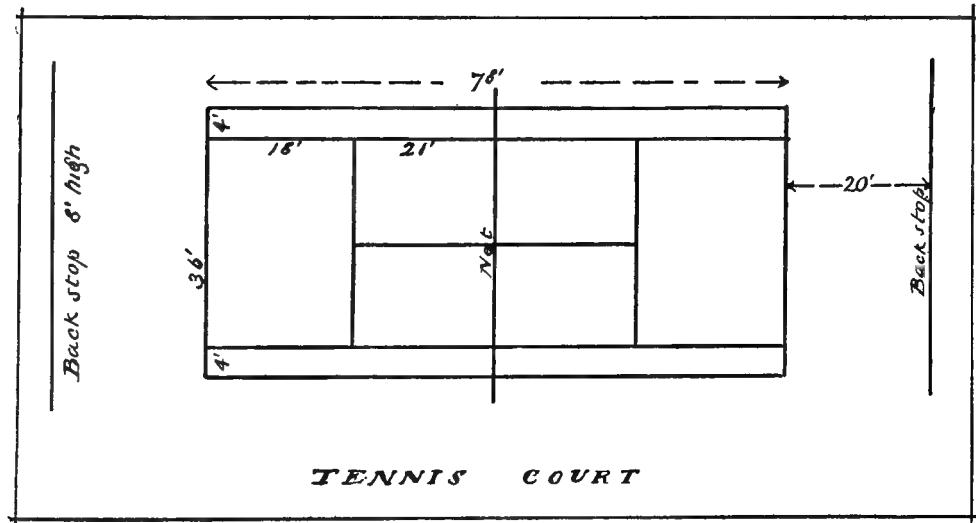


FIG. 41. STANDARD PLAN OF TENNIS COURT

regarding dimensions and all other requirements, including of course the practical requirements of construction.

The dimensions of the standard tennis court are shown on the accompanying drawing, being recorded in figures after the method

TENNIS COURT

often employed in architect's drawings. No variation from these dimensions should be allowed in any tennis court.

Assignments

The student should draw an accurate plan of a standard tennis court for preservation in his personal note-book.

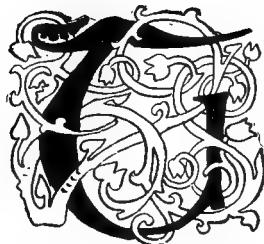
It will then be found worth while for each student, or for groups of students, to have actual practice in laying out a tennis court on the ground.

Questions

1. What materials are best for the construction of a tennis court?
2. What should be the cost of construction of a good court in various materials?

LESSON 24

BOWLING GREEN



HIS exercise is introduced here for two purposes. The first is to provide an interesting lesson in drawing. The second is to acquaint the student with the design of a bowling green.

Definition

A bowling green is a court, covered with thick, close turf, and used for bowling. This game of bowls upon the lawn is very different from the more popular game of bowling upon indoor alleys as practiced in America. The outdoor game is a favorite with Englishmen and Scotchmen, especially the latter. It is really a delightful outdoor sport and worthy of much wider acceptance in this country. It might well be introduced in parks, country clubs, college athletic fields and private grounds.

Assignment

The pupil will redraw this design to scale of $1'' = 10'$; or it may seem best to make a larger copy using the architects "quarter scale," i.e., $1'' = 4'$. Make a good clean drawing in ink. This design also works well when rendered in water color, but water color renderings are hardly worth the attempt unless the beginner has the personal help of an experienced teacher.

The bowling green proper is circular and 120 feet in diameter. It is, of course, perfectly level. It is depressed 2 feet below the surrounding terrace, and this depression adds much to its ornamental appearance. Of course it will then require drainage. There should be an open drain 6 inches wide and 3 to 6 inches deep around the margin, and this drain should fall to one or two outlets provided

with catch-basins through which the water will be carried by tiles to a suitable outlet. Or the whole area may be subdrained by porous

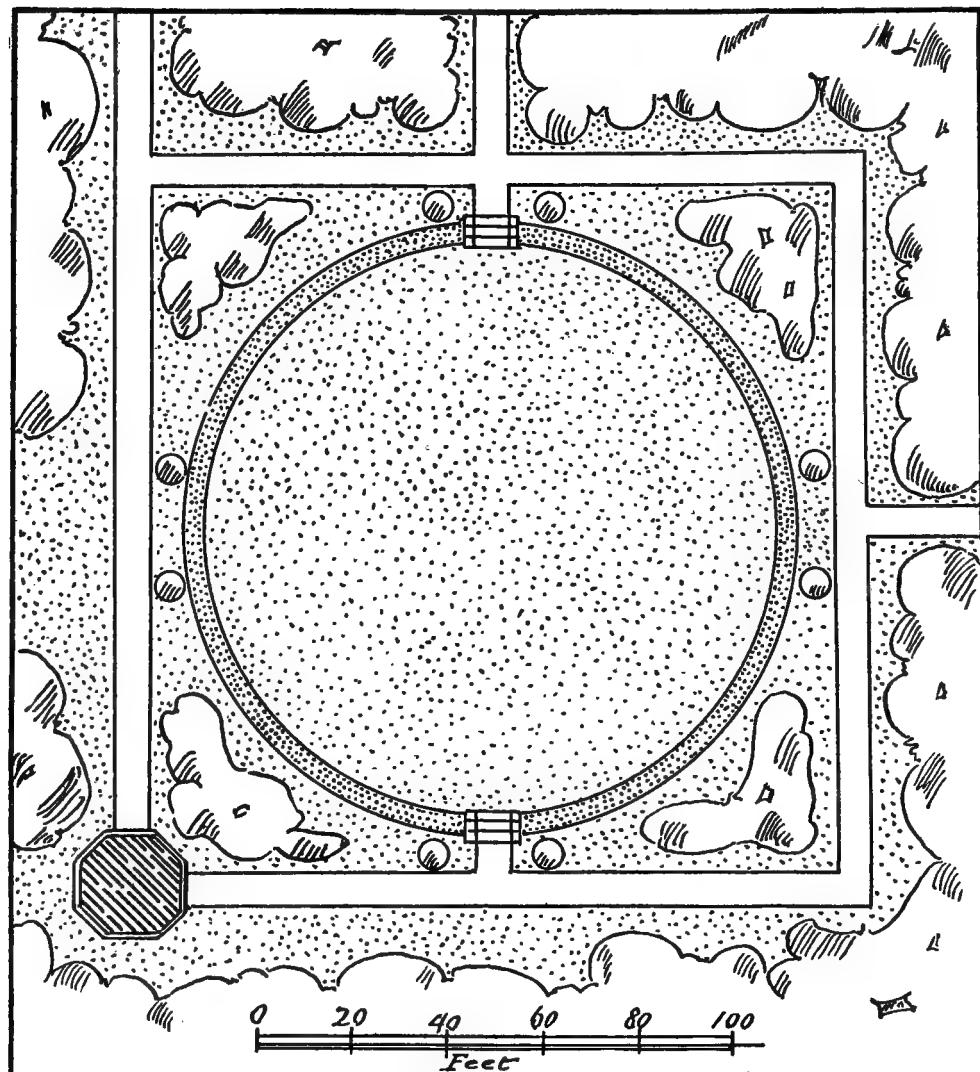


FIG. 42. PLAN OF CIRCULAR BOWLING GREEN

tile laid rather close together and comparatively near the surface. The design also shows a walk, certain plantings and a summer

BOWLING GREEN

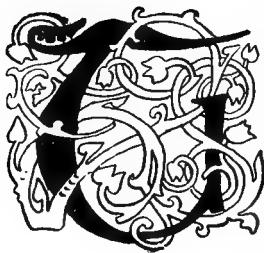
house or tea house. Such details could of course be varied to suit the surroundings wherever a bowling green might be built. This design is taken from Kemp's "Landscape Gardening."

As usually designed the bowling green is exactly square, 120 feet each way.

The horticultural problem of growing a close, hard, durable turf on the bowling green is a very pretty one, but it cannot be discussed here. Information on this subject can be found in books on golf, since the procedure is practically the same as in producing golf greens.

LESSON 25

VILLAGE CENTER



THE purpose of this exercise is to call attention to the very interesting, often very practical and sometimes beautiful arrangement which occurs in the unplanned growth of small villages, and to take up the study of similar civic foci where they can be found in the pupil's own neighborhood.

Description

The plan here reproduced shows a village center at Weston, Mass. The principal feature is that of the beautiful stone church standing on a moderate rise of land at the junction of four streets. These streets enter the plaza of the town in a very irregular manner, but these very irregularities produce unusually attractive street vistas, as can be understood even from the plan. The pupil is urged to imagine what the views would be like from different points in these streets and what sort of photographs would be available from different points of view.

It is a matter of interest to remember that the church grounds were laid out and planted by the late Charles Eliot, a famous landscape gardener of a generation ago.

This grouping constitutes in effect a civic center, though the only public buildings here are the church, the town hall, the store and post office.

Study

The pupil should copy this plan at a scale of $1'' = 20'$ though the teacher may omit the copying exercise if such a step seems necessary in saving time.

VILLAGE CENTER

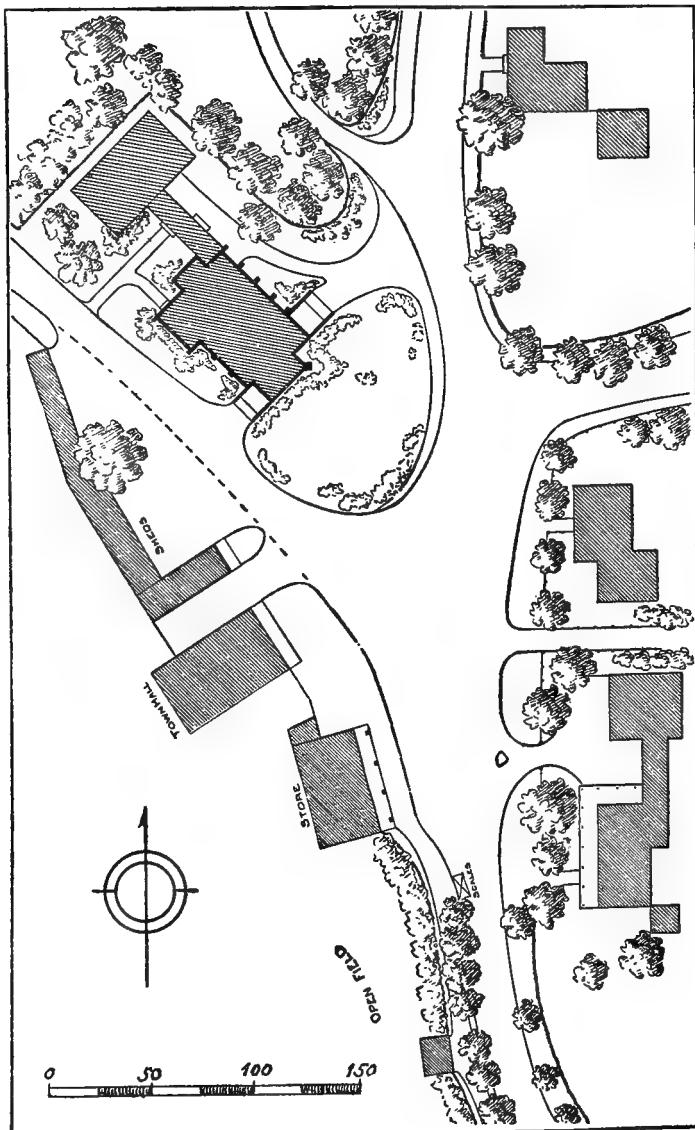


FIG. 43 VILLAGE CENTER, WESTON, MASS.

The most desirable study to be given to this problem may be found in the neighborhood of the school. If there are neighborhood centers, church grounds, schoolgrounds, street intersections or

TEXTBOOK OF LANDSCAPE GARDENING

other foci of similar nature they should be carefully studied and mapped. If the different members of the class can secure such



FIG. 44. VILLAGE CENTER LOOKING NORTH — SEE PLAN

surveys from a large number of different points and these surveys properly drawn out can be exhibited together for comparison and criticism the study will prove highly advantageous.

LESSON 26

WELL-HEAD



HIS lesson is intended to give the student practice in the design of architectural details. Such features have to be provided in connection with many works in landscape gardening. If they are large or elaborate they should be designed by a competent architect. If they involve plastic figures or groupings, a sculptor should be employed. In a large majority of cases, however, simple details of this character can be worked out by the landscape gardener. Much depends on his taste and skill in placing such garden ornaments, in constructing them to the most effective scale and in making sure that they correspond with their garden surroundings in style and treatment.

Statement

A well-head or curb is required on every well in regular use. Perhaps it is true that in a majority of cases, under present day practice, the well-head consists only of a pump surmounted by a windmill on its tower. Admittedly well-heads of the kind illustrated in the present lesson are not now in very general use. Nevertheless it is the pleasant fashion in many distinguished gardens to retain old wells and to decorate them with well designed curbs. These may be designed in a great variety of styles, a few of which are illustrated herewith.

Problems

The student should first copy some of the designs here shown. Copies may be made in pencil or ink, preferably the latter, and

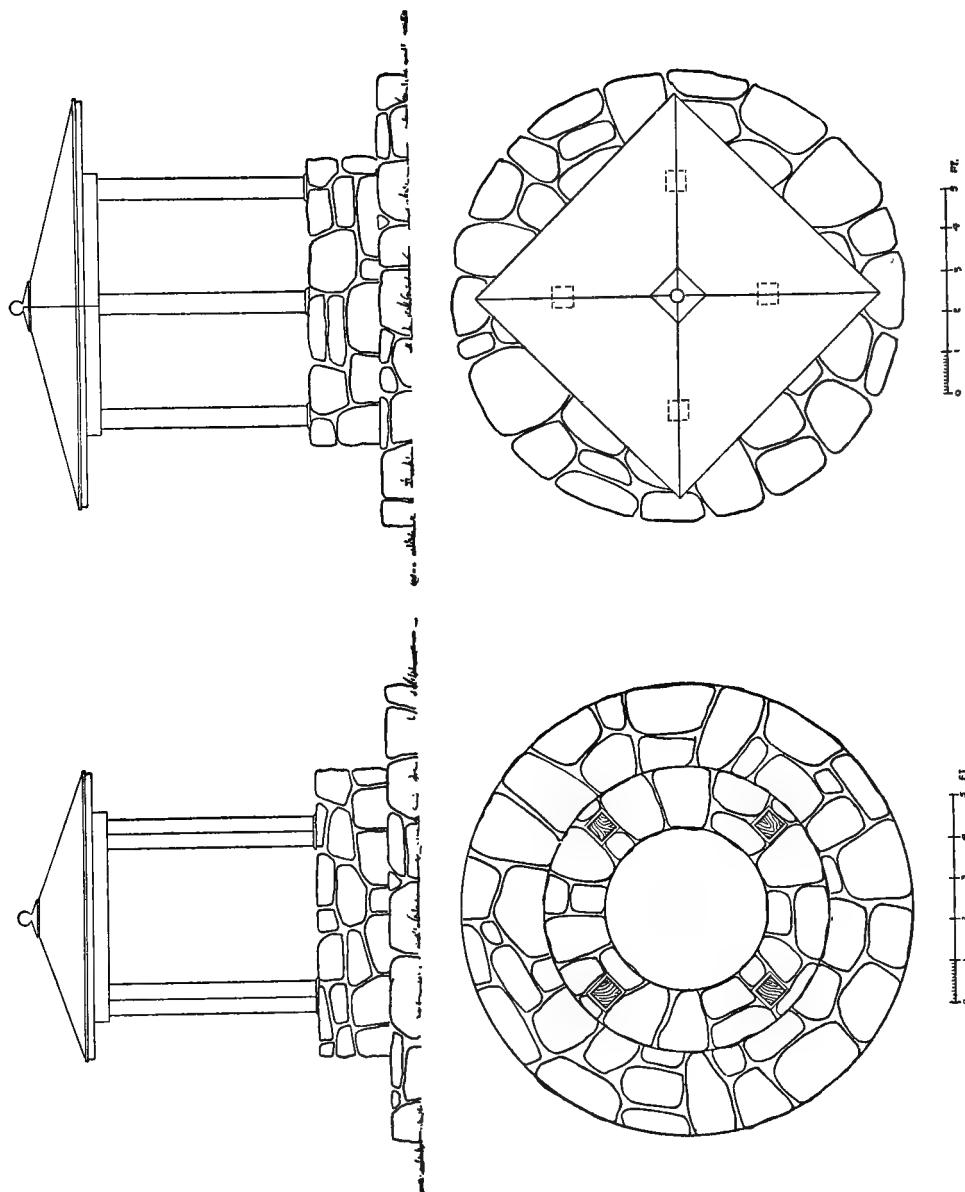


FIG. 45. STUDIES IN PLAN AND ELEVATION FOR A WELL-HEAD

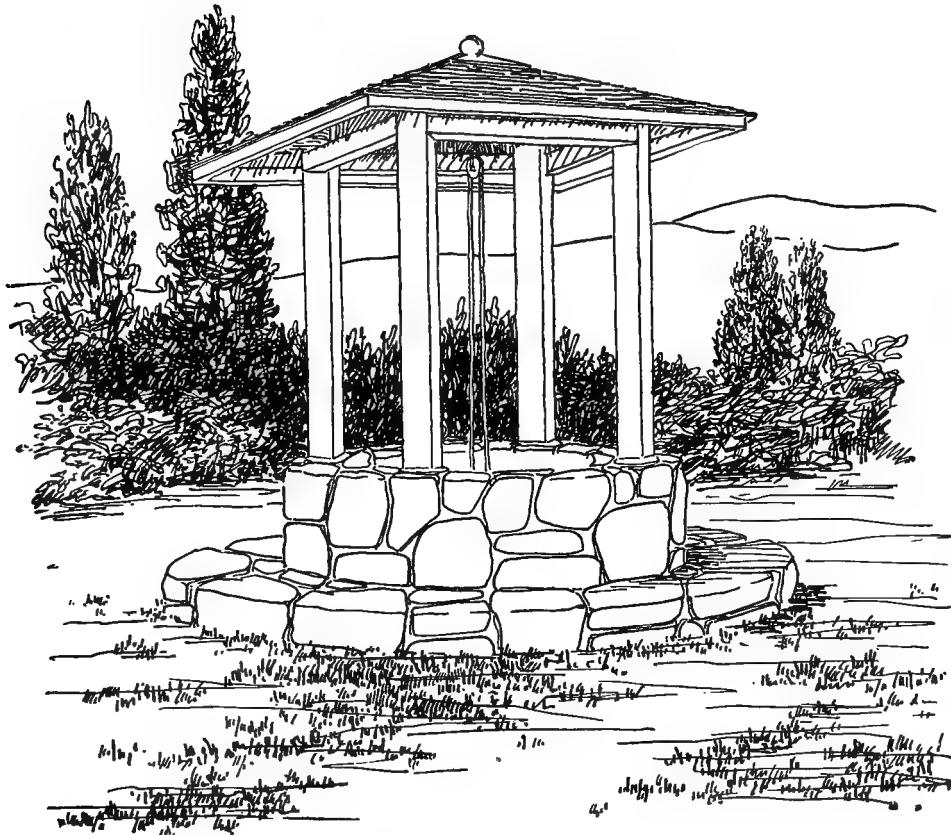


FIG. 46. PERSPECTIVE SKETCH

should show various aspects of the subject under study, such as ground plan, elevation and perspective.

The student should next look up other designs in other books. He should also explore the neighborhood in which he lives and, with camera or sketch book, make a record of the various well-heads which he finds, including installations of pumps.

Lastly the student should design one or more well curbs, either by revising examples discovered during his explorations or by making entirely new designs. These designs should be presented in the form of drawings similar to those used in this lesson.

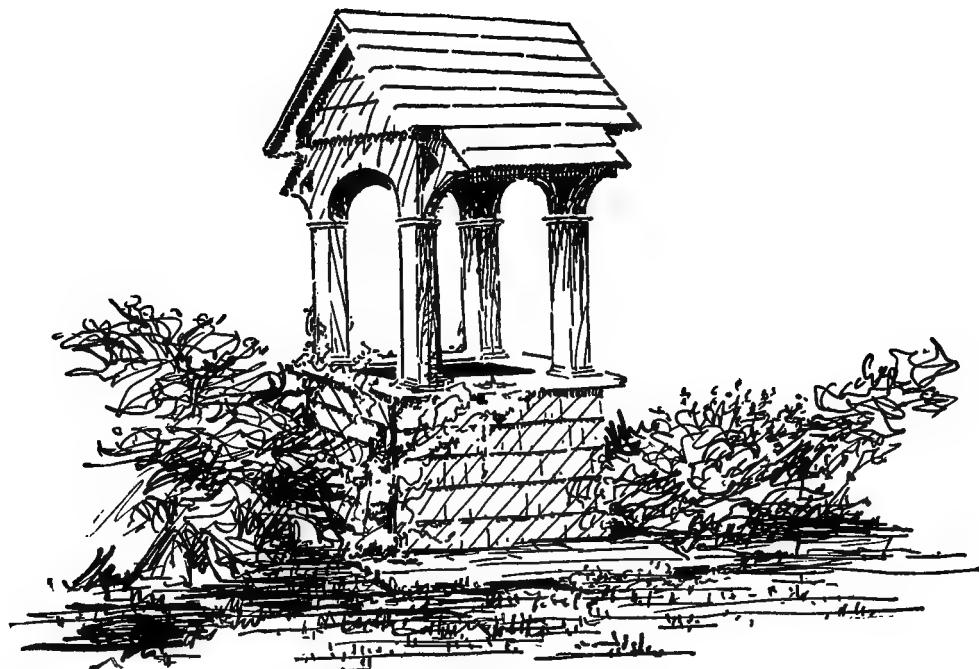


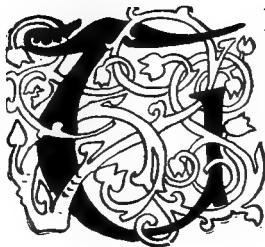
FIG. 47. SIMPLE RUSTIC WELL-HEAD



FIG. 48. PICTURESQUE WELL-HEAD

LESSON 27

GARDEN SEATS



HE purpose of this lesson is to give the student further opportunity for the study of architectural details as used in landscape gardening. It is expected that the student will work out a design for a garden seat, and the following suggestions are intended to help him in working out his own ideas.

Illustrations

Several garden gates are illustrated in Figures 49–54. The one to which the pupil's attention is first directed is the drawing, Figure 49, which shows a garden seat designed by Mr. Joseph F. Whitney, landscape architect. This seat is to be constructed of wood and may be painted either white or olive green.

The other examples shown will supply various suggestions to the student or working landscape gardener.

Argument

It is very important that every garden should be adequately and tastefully furnished. A garden without furnishings is as incomplete and unsatisfactory as an unfurnished house. The home garden should be built for use, but it cannot be properly used and enjoyed unless it has pleasing and comfortable furnishings.

Seats, tables and shelters are especially desirable, though other features of interest should be included, such as fountains, pools, bird-baths, sundials, gazing globes, statuary, pergolas, etc. etc. Probably the most important furnishings of all are garden seats and shelters, and the design, Figure 49, provides both.

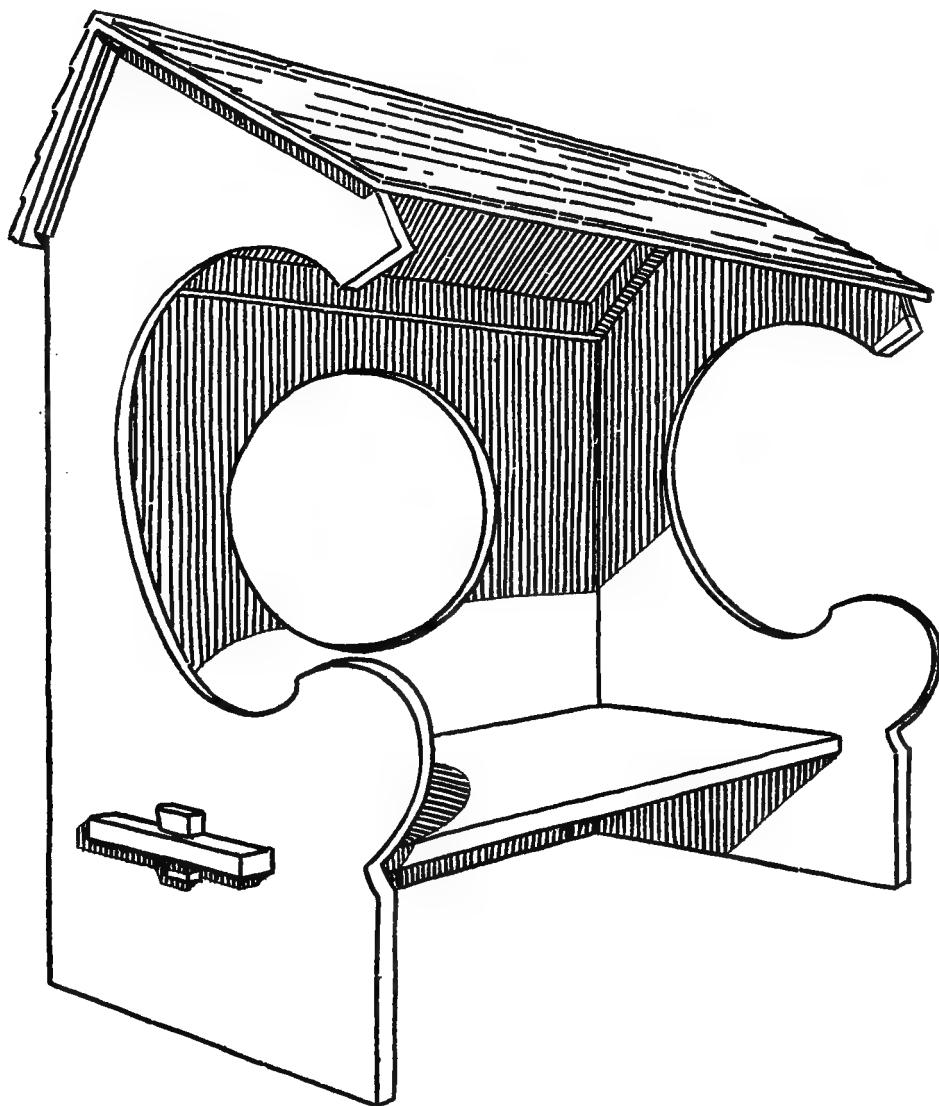


FIG. 49. SKETCH FOR A PRACTICAL GARDEN SEAT

Problems

The student should first of all make a copy of the design here shown in Figure 49. This figure is laid out with a T-square and triangle upon a drawing board, but the final drawing is done free-



FIG. 50. A GOOD SEAT WELL DESIGNED AND WELL PLACED



FIG. 51. EXCELLENT TYPE OF CEMENT SEAT

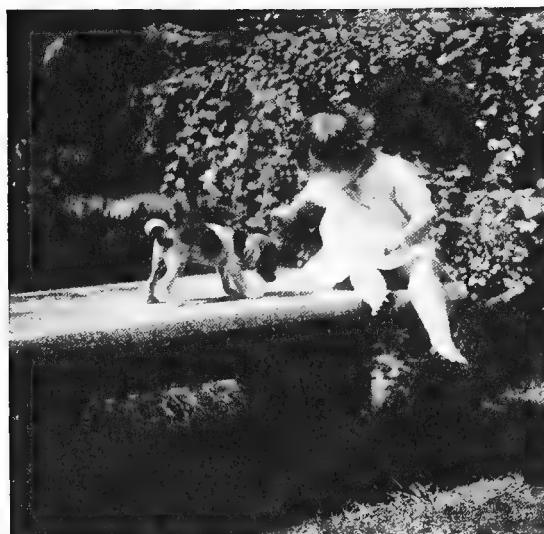


FIG. 52. HOME-MADE GARDEN SEAT OF CEMENT



FIG. 53. RUSTIC PARK SEAT

hand with a pen. The student should make his final copy either with pen or black pencil, preferably the former. Practice in the presentation of such objects is very desirable.

The student should next undertake an original design for a garden seat. He may adopt any of the forms indicated herewith, though there are many other forms equally desirable. Several



FIG. 54. WOODEN PARK BENCH

suggestions can be found in Mr. Underwood's book mentioned below.

It will be most desirable for the student to undertake this design for some particular location in some particular garden. The conditions thus known will determine the measurements and general style of the seat to be designed. The seat may then be designed for construction in wood, cement or other material.

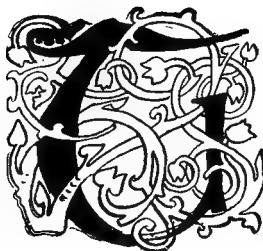
Under the most favorable conditions it will be possible for the student also to construct a garden seat from his own design or to superintend such construction. The possibility of carrying out any of these designs should never be overlooked.

Reference Readings

UNDERWOOD, *The Garden and Its Accessories*.
NORTHEND, *Garden Ornaments*.

LESSON 28

GARDEN GATE



HIS lesson offers another opportunity for the pupil to get some experience in the design of garden details. Garden gates of one sort or another are desirable in many situations. Farm gates may also be made attractive by good proportions and sound structure without any offensive "ornamental" treatment.

Illustrations

Two designs for garden gates are here shown (Figures 55 and 56). The first is an elevation with structural cross-section showing a

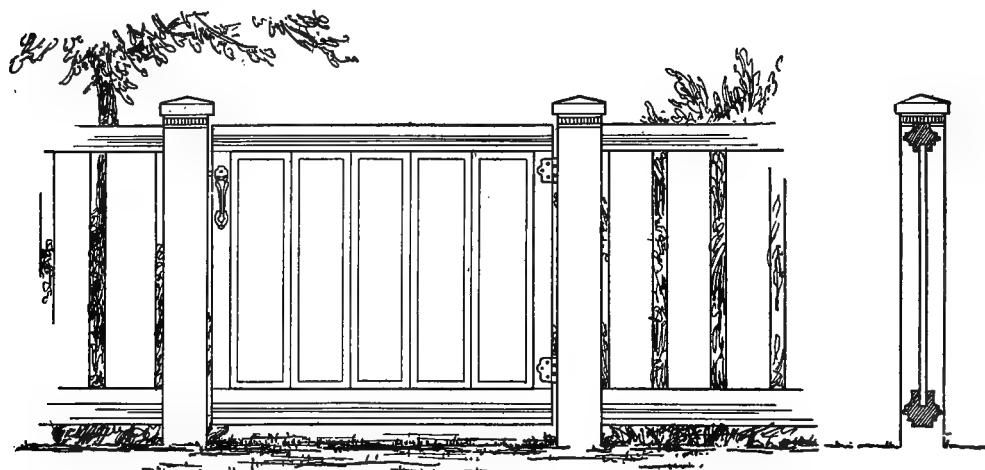


FIG. 55. PLAIN GATE OF MATCHED LUMBER

simple gate in paneled wood. The second design shows a more elaborate, though still simple design, for a garden gate in open wood-work with spindles. Over the gate is an arch which should eventually be covered with roses, trumpet vine or other good climbing plant.

GARDEN GATE

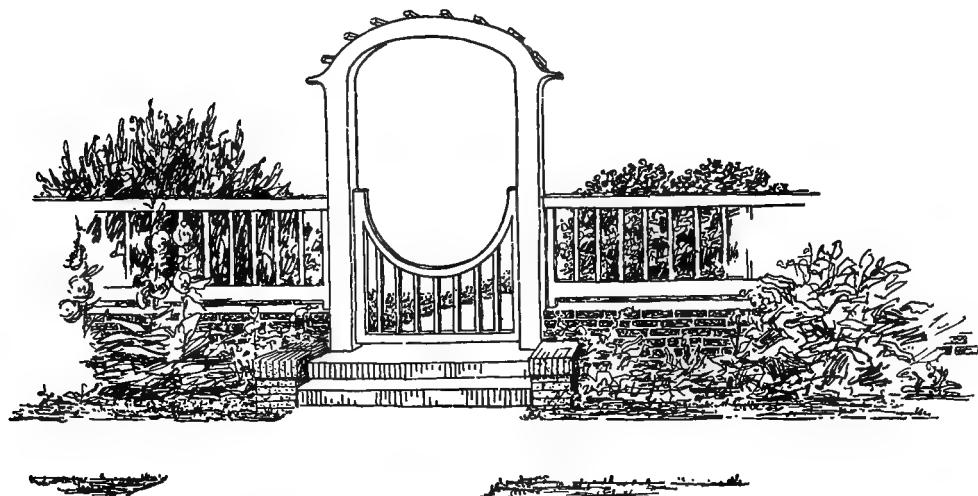


FIG. 56. SKETCH DESIGN FOR SIMPLE GARDEN GATE BY DOROTHY WAUGH



FIG. 57. OLD FASHIONED WOODEN GATE AND PICKET FENCE

Discussion

In all cases the garden gate offers an opportunity for effective design. It should be made an interesting and attractive feature. Nothing could better illustrate than a gate problem of this sort what are the essentials of good taste in design. The most attractive



FIG. 58. ROSE ARCH USED AS A GARDEN ENTRANCE

gate is certainly not the one which has the most elaborate, expensive and fanciful ornaments. It is rather one which has good proportions, simplicity, dignity and sound construction.

As will be seen in these designs and in the photographs and sketches reproduced in this same chapter such a garden gate can hardly be made attractive without the liberal use of plants, — trees, shrubs, vines, hardy perennials. All such materials combine delightfully with items of this kind.

Problems

One or more of these designs should be copied at an enlarged scale. Such copies may be made in pencil, crayon, charcoal or ink.

The pupil should make a careful hunt throughout the neighborhood for other gates, and should make photographs or drawings of



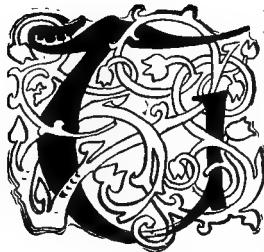
FIG. 59. A CALIFORNIA GARDEN GATE -- Photograph by JOHN W. GREGG

every one which has any merit. A collection of such sketches will prove interesting and useful.

The pupil should next make one or several designs for gates, preferably for known surroundings. These designs are most easily worked out as flat elevations to scale, but the student should also practice the presentation of his ideas in perspective as shown in Figures 46, 49 and 56.

LESSON 29

SMALL HOUSE LOT



HE object of this lesson is to study a typical small home lot. This lot has a 60 foot front and is 100 feet deep. There are hundreds of thousands of home lots of approximately the same dimensions in American cities and towns.

Problems

The pupil should copy this drawing at a suitable scale. If time permits a water color rendering may be made. This is a suitable subject for practice with water colors.

The pupil may also make a revised plan for the same lot and house.

It is highly desirable also that the pupil make additional designs for other grounds of similar character. Such work should be done as far as possible upon existing examples. The grounds should be surveyed and mapped, existing conditions of soil, drainage, sunlight, etc., should be determined and taken into consideration in making up the design and selecting materials for the planting plan. Such work, especially if carried out under a good teacher, may be extended to an indefinite number of examples.

Discussion

It will be observed that this lot faces to the north, giving the house also a north frontage. This orientation is commonly regarded as undesirable in American village life. It is on the contrary the most desirable frontage possible, unless the house can be faced to the northwest; but to realize the value of such a building lot it is

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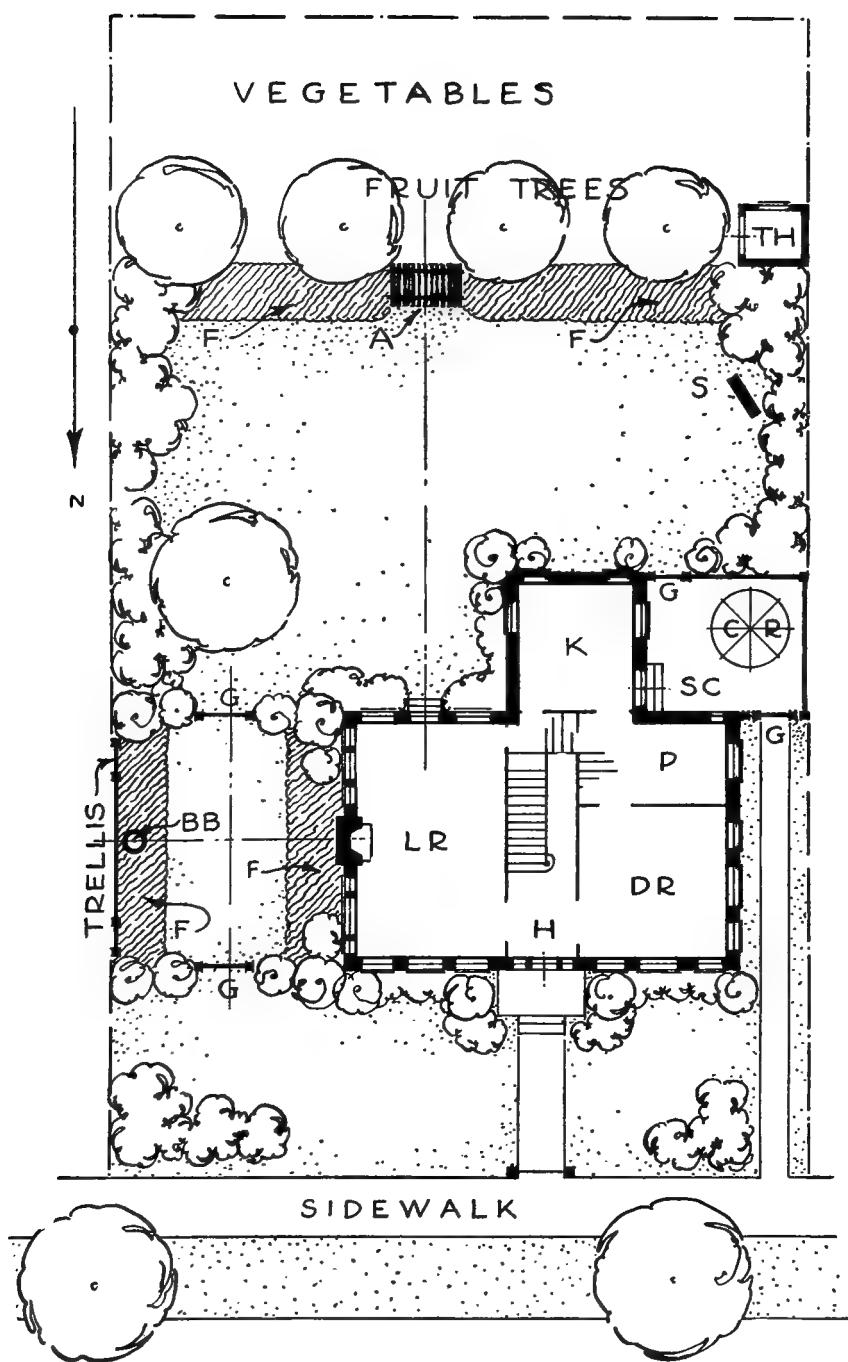


FIG. 60. DESIGN FOR SMALL HOME GROUNDS

necessary to depart from the customary arrangement in important particulars.

The most important adjustment is in placing the house as near the street as possible, thus greatly reducing the breadth of the conventional "front yard," and by the same amount increasing the

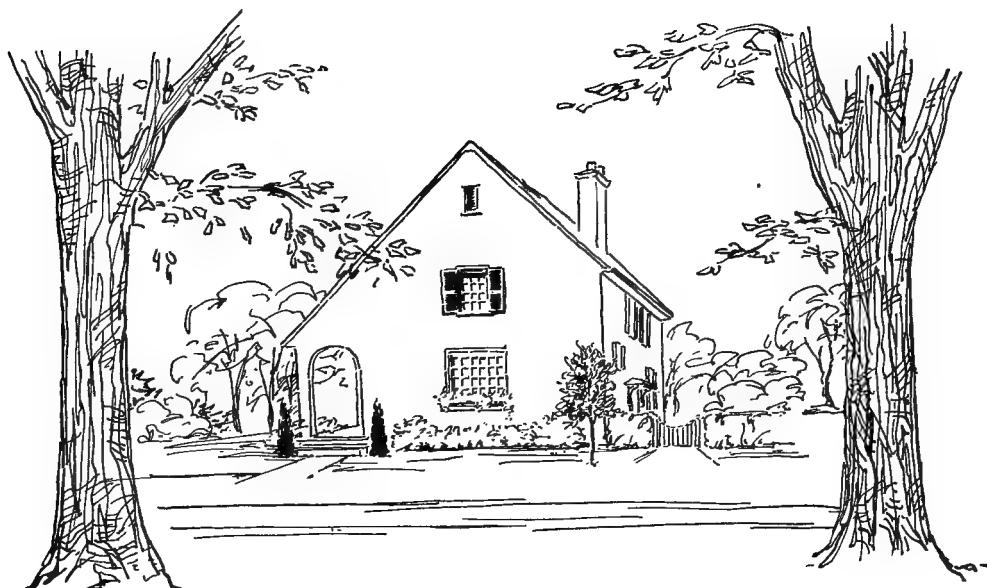


FIG. 61. FRONT VIEW OF HOUSE AND GROUNDS

extent of the private garden at the rear of the house. This private garden now lies on the sunny south side of the house and may be developed into something much worth while.

The conventional floor plan here used might be improved by placing the kitchen on the northwest corner of the house and transferring the dining room to the southwest corner. Thus the living room and dining room would get the maximum of sunlight and would look out onto the garden instead of onto the street. Much depends obviously on the habits and tastes of the family occupying the house.

In front of the house is a small strip of smooth lawn. Against the house are simple foundation plantings. A short straight walk

leads to the front door, and a narrower straight walk leads to the service area and kitchen entrance.

The narrow rectangular space directly east of the house, which is frequently left open giving a vista looking from the street deeply



FIG. 62. COZY SMALL HOME GROUNDS

into the garden and grounds is here closed by small gates supported by plantings and a very simple enclosed formal flower garden with bird-bath is developed. This treatment works a complete separation between the front yard and the private garden at the rear. As a rule American home gardens are seriously lacking in privacy.

The little formal garden thus made constitutes a distinct and interesting feature of the grounds. It supplies an artistic transition from the front yard to the private garden. It is not merely "something different," but it seems to fit naturally into its surroundings.



FIG. 63. DWARF FRUIT TREES ARE SUITABLE FOR THE SMALL HOUSE LOT

The main feature of the grounds is the family lawn or garden occupying a main portion of the space immediately south of the house. The principal living room window looks out across this lawn to a rose arch which forms a passageway into the vegetable garden at the rear. The east and west ends of this garden are bordered by hardy shrubs. The south side has a border of flowers. At the northeast corner is the only large shade tree provided in these small grounds. This may be an oak, elm, maple or any other deciduous species of good size and dignified appearance. It is

S M A L L H O U S E L O T

placed southeastward from the house in such a position that its shadow will be thrown upon the building during the heat of the day.

This design is adapted to a practically level lot. Where considerable slope is found, either toward or away from the street, the problems of architecture and garden design are seriously complicated, though very delightful arrangements can be secured if enough competent study is given to such problems.

Readings

REHMANN, *The Small Place, New York*, 1918.

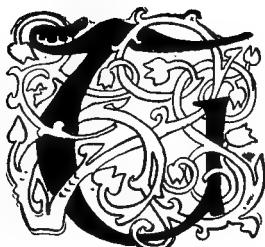
KELLAWAY, *How to Lay Out Suburban Home Grounds, New York*, 1907.

HAMBLIN, *Book of Garden Plans, New York*, 1916.

ROOT, *Landscape Garden Series, Book II*.

LESSON 30

SUBURBAN HOME GROUNDS



HIS exercise presents a typical example of home garden design in which it is the intent to emphasize the fundamental structural features.

Exercise

All members of the class should copy this drawing to a suitable scale. The drawing, Figure 64, presents the plan in ink; in Figure 65 the same plan is rendered in water colors. The teacher will decide whether the pupils should undertake these reproductions in one medium or both. If the class has time enough on this course it will be well to use both methods.

Explanation

First we may observe the orientation of the house, which faces the northwest. This brings the living rooms and principal bedrooms on the southeast and southwest angles where they will secure a maximum of sunlight.

Next we should consider the most important feature of the design which consists in the subdivision of the grounds into three distinct parts, based on use. These parts are —

- a. The public portion, or front yard.
- b. The private portion, or family garden.
- c. The service portion, including laundry yard, garage, vegetable garden, etc.

The front yard is on the same side of the house as the public room, i.e., the front hall, with which it directly connects. The family garden connects directly with the living room and has the

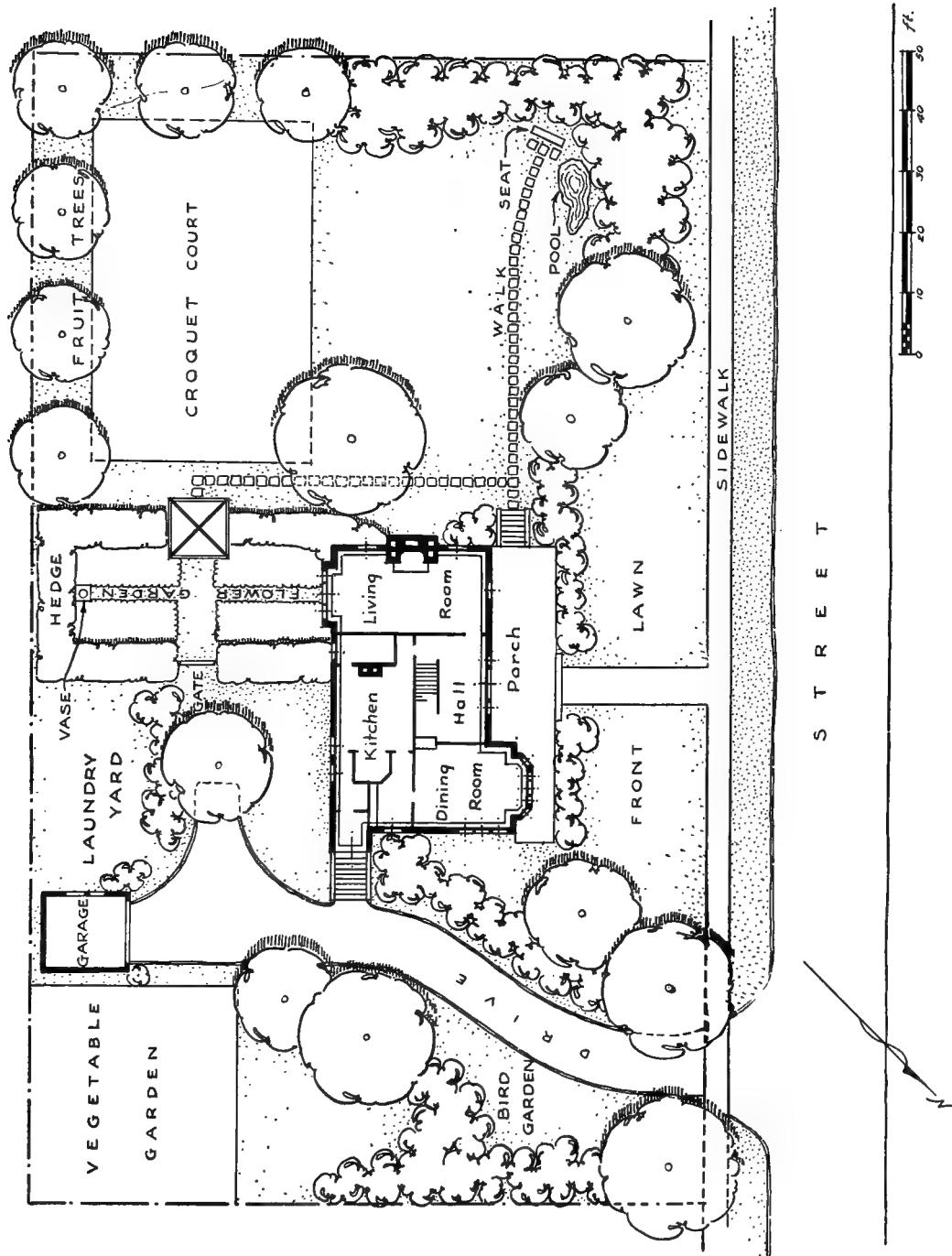


FIG. 64. PLAN OF TYPICAL AMERICAN SUBURBAN HOME GROUNDS

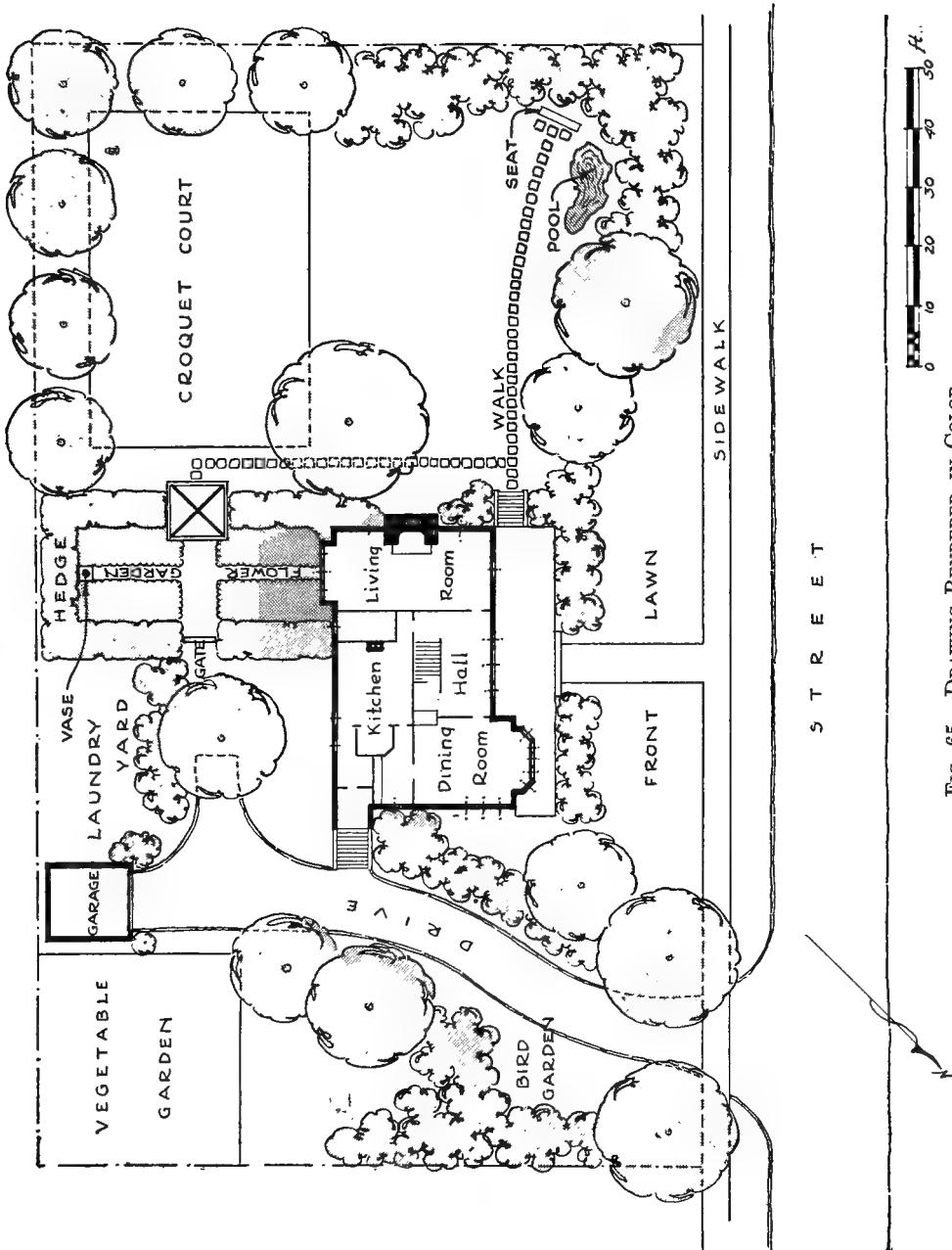


FIG. 65. DRAWING RENDERED IN COLOR

S U B U R B A N H O M E G R O U N D S

same character of private family use. The service area connects with the kitchen and laundry. These three areas are somewhat



FIG. 66. COTTAGE RESIDENCE AND SUBURBAN HOME GROUNDS

distinctly separated from one another. The plan of the grounds thus becomes structurally related to the plan of the house. Both plans are based clearly on daily use.

The front yard is comparatively small, as the front hall should

be. One would hardly want his front hall to be larger, better furnished and more important than the living rooms of his house; yet on thousands of suburban grounds the front yard constitutes practically the whole of the grounds.

The family garden in this plan is the largest and most important area. It is enclosed, being shut off especially from the



FIG. 67. THE FLOWER GARDEN IS A FEATURE OF SUBURBAN GROUNDS

street. It should have the same privacy as the living rooms of the house. It should have many attractive features such as flower garden, pool, croquet or tennis court, fruit trees, etc. It should also be furnished for use, with seats, tables, shelters. (The summer house or shelter is here shown between the formal flower garden and the main lawn.) The flower garden is shown enclosed by a hedge and somewhat formalized, with the main axis upon the axis line of the living room. This is designed to give a particularly effective picture when viewed from the French door and windows of the main family room.

Other features to be noticed are (a) the large deciduous trees

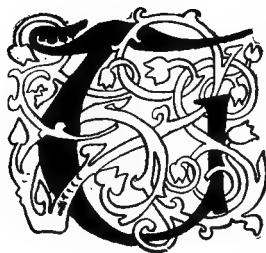
at the south and west of the house where they will cast their shadows on the house walls; (b) the trees at the north and northwest placed so as to frame in the view of the house as seen from the street; (c) the bird garden which serves also as a screen for the service yard and a windbreak, and which can be seen from the dining-room windows; (d) the foundation plantings; (e) the economical Y turn for the automobile; (f) the inclusion of fruit trees in the garden scheme, where on the south there may be a direct transition from the family garden to the orchard.

Questions

Why is privacy important for the family garden? Does American practice give less privacy to the home grounds than is customary in England, Germany, France or Italy? Are there good reasons for this difference?

LESSON 31

SUBURBAN HOME GROUNDS



HIS lesson is intended to give further opportunity for the study of the problem involved in the development of home grounds — one of the most important problems in landscape gardening. The solution for the home grounds problem naturally varies greatly with varying physical conditions, and even more with the domestic requirements and tastes of different families. The present problem should be studied in connection with other home grounds problems taken up in lessons 29, 30 and 32.

Illustration

The plan shown in Figure 68 was prepared by Mr. O. C. Simonds,* landscape architect, Chicago, Illinois, for a home lot in Cedar Rapids, Iowa. The tract is a suburban lot of rather large size, approximately 115 by 270 feet and sloping toward the back.

Solution

It will be observed that the solution of this problem is based clearly upon the principles explained in Lesson 30. The space is plainly divided into three areas (1) the public lawn or front yard (2) the private grounds and garden, opening directly from the principal living rooms and comprising a sort of outdoor theater lawn, a flower garden, a formal garden, pool, pergola and a more or less ornamental vegetable garden (3) the service area at the northwest angle of the house and connected directly with the service

*Simonds, *Landscape Gardening*, p. 133, New York, 1920.

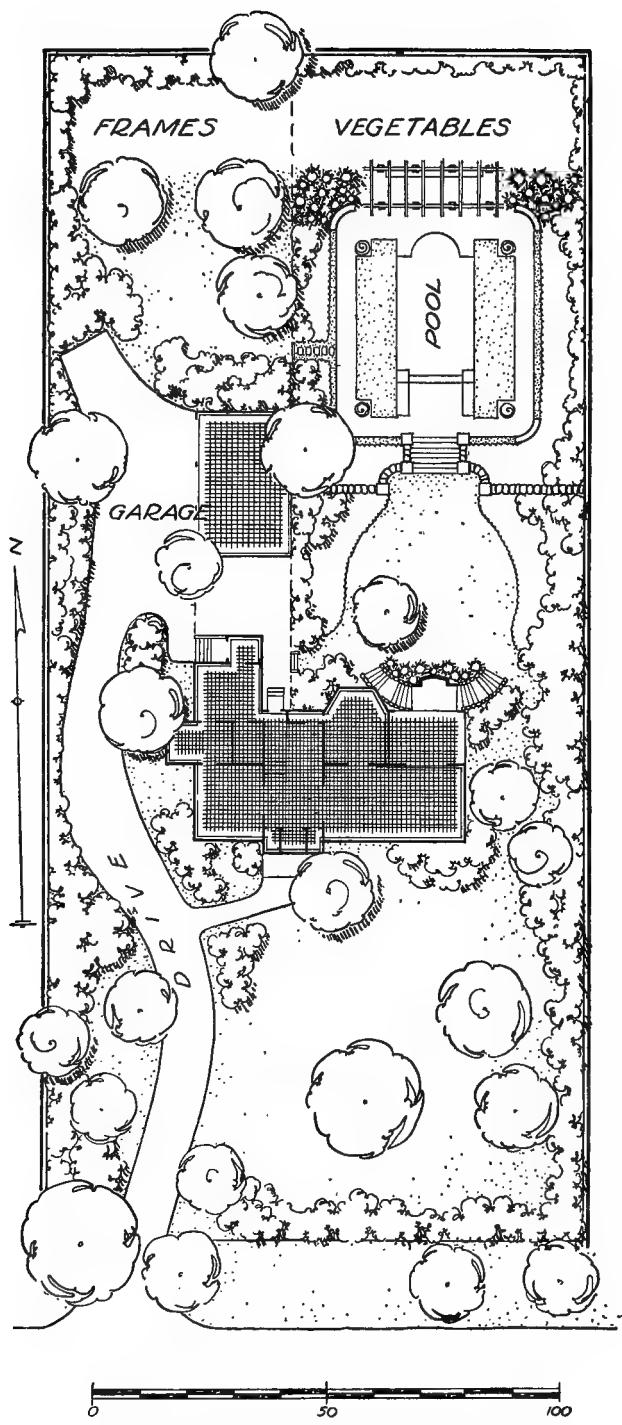


FIG. 68. DESIGN FOR LARGE SUBURBAN LOT

rooms of the dwelling, this area including kitchen yard, garage, automobile turn, an area for hot-bed, compost heap, and other garden and kitchen services.

In the present plan the house has been placed relatively far back from the street, an arrangement justified by the large size of



FIG. 69. FLOWERING DOGWOOD ON THE LAWN

the house and by the ample size of the grounds. This gives space for a naturalistic park-like treatment of the front yard, a treatment highly approved by American taste and practice.

The private garden is worked out in semi-formal style on two levels, the various parts being compactly arranged. This gives a feeling of snugness and intimacy desirable in every family garden and essential to the success of a formal garden. It is easy to imagine that this garden, when fully developed, would yield a large number of very attractive photographs. This means that it would present

S U B U R B A N H O M E G R O U N D S

many pleasing views. Such a test is highly appropriate to any piece of landscape gardening, especially to works of this particular sort.

The automobile drive is provided with a Y turn at the garage. Next to the house the drive is widened on the curve. This not only makes the curve easier but provides space in which an automobile may stand during the day without blocking the passage.

The entire grounds are enclosed by a heavy border of trees and shrubs, the chief purpose of which is to secure privacy.

Problems

The pupil should copy this plan at a suitable scale, probably $1'' = 20'$. The copy should be made in ink. It may be colored with crayon or water-color. This is an excellent plan for rendering in either of these media.

Secondly the student may make a new plan suggesting alternative arrangements for the same house and grounds.

If proper supervision and criticism are at hand the student should make complete planting lists for these grounds, specifying the kinds and numbers of trees and shrubs to be used.

The student may also work out detailed plans for various features in these grounds, especially the pergola, the pool, the garden steps and wall, or even the garage.

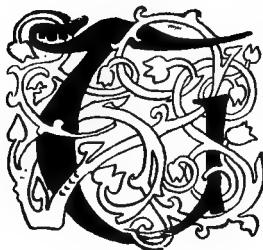
This is an important design and considerable time can advantageously be spent upon it.

Reading

SIMONDS, *Landscape Gardening*, Chap. VIII.

LESSON 32

FORMAL GARDEN



HIS lesson should give the pupil an introduction to the principles involved in the design of formal gardens and to some of the considerations which influence the use of the formal style in landscape gardening.

Definition

The formal style in landscape gardening is that method of design which employs a geometrical and symmetrical arrangement of parts. It is distinguished from the natural style which employs the forms and invokes the spirit of nature. Any definition of the formal style should include also the idea that the formal garden is animated by a spirit entirely different from that of the naturalistic garden. Speaking broadly this is the human spirit as contrasted with the spirit of wild nature. The formal garden connected with the private dwelling should be snug, intimate, personal, inviting to social loitering, obviously the work of human hands and obviously intended for human use. The large formal gardens, like those of Versailles and of princely estates and public grounds generally, are quite as plainly the work of human hands and as clearly intended for human use, though in this case for the public use of large companies.

It is essential here to observe that every work of landscape gardening, if it be in any degree successful, must have both a form and a spirit, and that these two must be closely correlated and fully adapted to one another. Any description, therefore, of any garden, or any definition of any style, must consider both its form and its spirit. And though spirit is hard to define and hard to understand

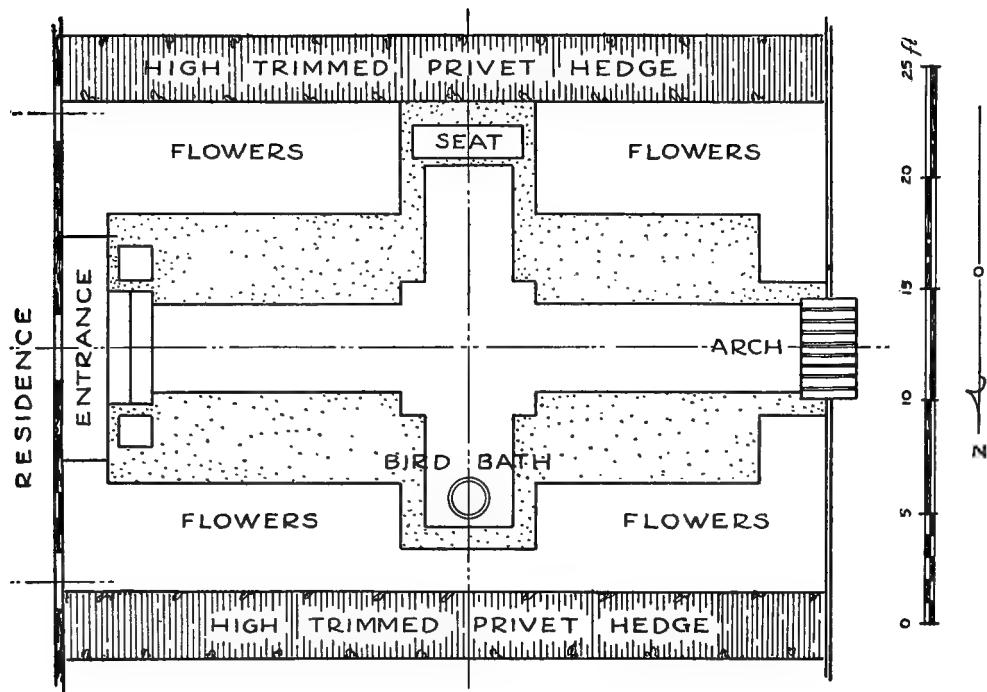


FIG. 70. GENERAL PLAN FOR FORMAL GARDEN

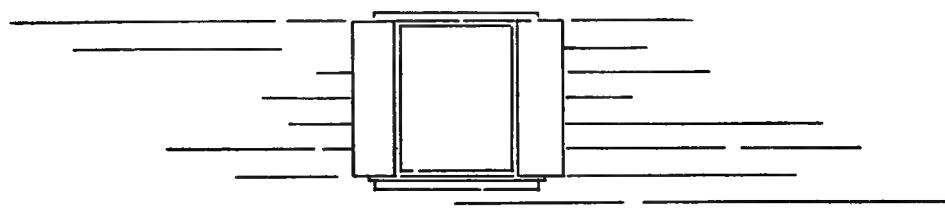


FIG. 71. THE HOUSE AS SEEN FROM THE GARDEN

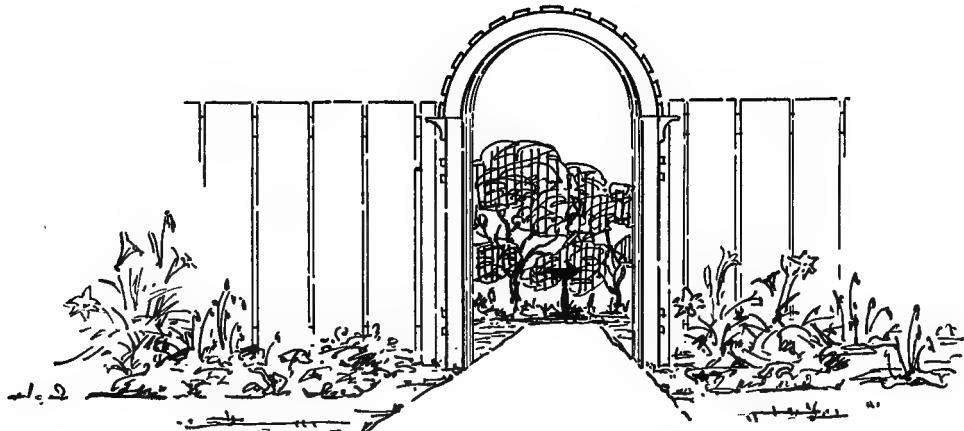


FIG. 72. THE GARDEN GATE AND ROSE ARCH



FIG. 73. THE BIRD BATH



FIG. 74. THE GARDEN SEAT

it is the more important of the two, so that a special effort must be made to fix this quality clearly in mind.

Argument

Much time has been wasted in years gone by in arguing that the formal style is better than the natural style, or vice versa. Powerful arguments may be made *in the abstract* for either style; but practically, as well as from the highest standpoint of art, the decision is always to be made, not on abstractions, but in view of concrete conditions existing in particular instances. Thus in one set of conditions and on a given piece of property a design in the formal style may have overwhelming advantages, while on another piece of land and under different requirements the natural style may be clearly preferable. This principle is now generally recognized by all competent landscape gardeners, and controversy on these matters is possible only between persons of quite limited education and narrow views.

Working Rules

It is always dangerous in art matters to lay down dogmatic rules. While recognizing these dangers it still seems best to make certain rules or suggestions covering the design of gardens in the formal style. These should prove helpful to the beginner, who must understand, however, that the experienced designer is sometimes able to break some of these rules without disaster. With such limitations in mind the following rules are offered:

1. Formal gardening should be attempted only on relatively small areas. For the ordinary family garden one-fourth to one-half acre would be the maximum allowance; for a very pretentious private mansion 1 to 2 acres; for large public grounds 3 to 5 acres. Best results are usually secured on areas considerably smaller than these maxima.
2. The area should be rectangular or nearly so. Circular or semi-circular areas can sometimes be designed, but they are difficult.

3. The area should be level or nearly so. Where it slopes distinctly it should be brought to two or more levels by terracing.

4. The formal garden should be wholly and distinctly enclosed by buildings, walls, hedges, etc. Occasional outlooks may be pro-

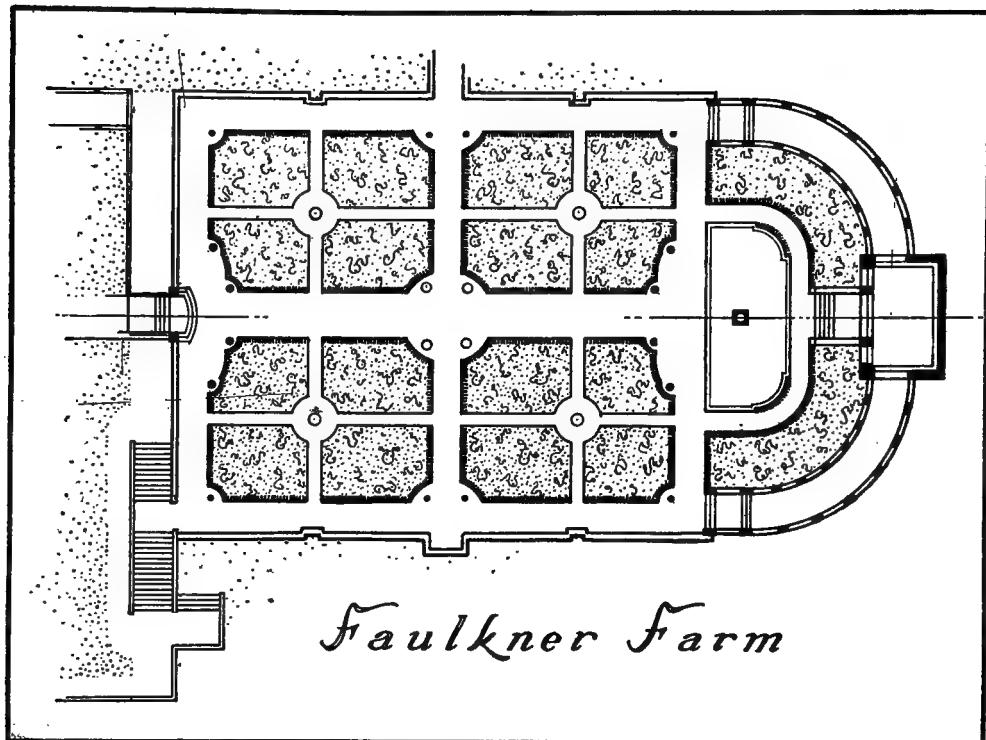


FIG. 75. PLAN OF A FAMOUS FORMAL GARDEN IN MASSACHUSETTS

vided through or over these bounds, but they must be managed with great skill.

5. In this rectangular space no definite proportion between length and breadth is obligatory, but best results can usually be secured with a ratio about 7: 5 or 8: 5.

6. Each garden must have as its chief structural feature a major axis. This will nearly always be developed on the median longitudinal line. In exceptional cases the main axis may be developed transversely to the greatest length of the garden.

7. At right angles to this major axis a minor axis should be developed. In some cases two or three minor axes are permissible. In rare cases also the minor axis may be merely indicated or entirely suppressed.

8. The minor axis or axes must be distinctly subordinate to the major axis in all particulars, — in width, in length (usually),



FIG. 76. GENERAL VIEW OF A FORMAL GARDEN

in interest and in termini (see 10, 11 and 12). In a garden having several minor axes their combined length should be less than the length of the major axis.

9. Major and minor axes will often be treated as paths. These paths should be nicely proportioned to the size of the gardens. As a mere suggestion the width of the path on the major axis may

be about 10 per cent of the width of the garden; that of the minor axis less.

10. Each axis must be provided with suitable termini, and these termini must appear definitely at the ends of the axes.

11. These termini must be objects of definite interest and beauty. Those features most commonly employed are fountains, sun dials, seats, arbors, pergolas (of doubtful suitability), statues, tea houses, and small buildings generally. A broad outlook over several miles of beautiful scenery does not terminate any axis; and it is never permissible to allow any axis to disappear into any exterior view.

12. These terminal features must be carefully proportioned in size and interest to the length and importance of the axes on which they are placed. Roughly speaking the height of the terminal features may be 10 per cent of the total length of the axis. Features on the major axis must be distinctly larger and more interesting than those on the minor axis. In case several minor axes are developed their termini must be plain and inconspicuous; nevertheless definite terminal features must be provided.

13. Fountains, arbors, belvideres, etc., must not be built within the garden so as to obstruct the general view. Under no circumstances should anything be built upon any axis intermediate between the termini in such a manner as to interrupt the axis line. The intersections of axes may often be marked by pools of flat water (not playing fountains). Pools in this position are attractive on account of the reflections they offer toward the principal points of view.

14. Whatever treatment is given to the free rectangular spaces outside the axes is better applied to the margins of such spaces than to the centers. The centers of such spaces should be left free, or at any rate should not be made sites for mass effects of architecture or planting which would compete in interest with the axial termini.

FORMAL GARDEN

15. Color effects, where attempted, are better developed along the boundaries, in walls, hedges or border plantings, than in the interior spaces.

16. Details of architecture and sculpture must of course be kept consistent throughout the garden. Simple and classical forms are usually to be preferred. So-called "rustic" works are seldom appropriate.

Illustration

Figure 70 represents a formal garden in approximately its simplest terms. A dwelling house bounds the garden on the east with hedges on north and south and a high wooden fence on the west end (Rule 4). The major axis lies lengthwise of the garden and the minor axis bisects this at right angles (Rules 6 and 7). These axes are terminated by the dwelling house door, the arched gateway, the bird-bath and the seat (Rules 10, 11, 13). These terminal features are sketched in Figures 71, 72, 73 and 74.

Another formal garden, a much more elaborate example, is shown in Figure 75. This is the famous formal garden at "Faulkner Farm," Brookline, Massachusetts, and was designed by Mr. Charles A. Platt, of New York. The main terminal feature, on the main axis opposite the dwelling, consists of a beautiful summer house connected with a pergola or peristyle.

Problems

The pupil should look up other plans and photographs of formal gardens, all of which should be examined in detail to see how nearly they conform to or how far they depart from the rules given in this lesson. The pupil must of course consider for himself how far such studies confirm the rules.

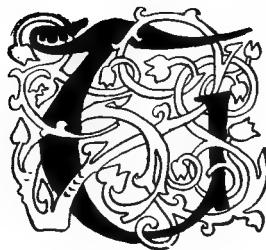
The most valuable studies in this lesson, however, will be possible if the pupil is able to visit one or more formal gardens, especially if he is so fortunate as to gain admittance to good gardens designed by competent landscape architects and developed by owners of

taste. If in any manner possible such gardens should be carefully surveyed and mapped. They will, of course, be tested by the rules already studied.

Finally the pupil should design one or more formal gardens. Purely imaginary problems are not without value; but generally it is much better to make these designs for known pieces of ground and known conditions.

LESSON 33

A GARDEN IN THE NATURAL STYLE



THE purpose of this lesson is to bring before the student the principles underlying the use of the natural style in landscape gardening, more especially the use of this style in the small domestic garden.

Discussion

The natural style of landscape gardening has its most important application in the preservation and development of large areas of natural scenery such as those found in National Parks, National Forests, State Parks and Forests, large country parks owned by municipalities, and grounds of large country clubs. It is well adapted also to the development of large private estates, and in a more or less modified form comes into good use in developing such areas as college campuses, city parks and park cemeteries. A still further modified naturalistic or informal style of landscape gardening may be made entirely satisfactory upon small home grounds.

Americans and Englishmen generally have a strong and inborn preference for this natural type of scenery and for the natural style of landscape gardening founded upon it. For this reason the natural style is sometimes forced upon land unadapted to it and into an environment better suited to formal types of gardening. There is also a popular notion (which is very far from the truth) that the natural style of landscape gardening is very easy to do. The idea seems to be that as long as objects are kept away from straight lines, all walks are made crooked and all plantings irregular, the result is informal and must necessarily be natural. The fact is quite the contrary. The truly successful piece of natural gardening arti-



FIG. 77. VILLAGE HOME GROUNDS IN THE NATURAL STYLE

ficially accomplished is one of the rarest pieces of fine art in existence. Indeed it requires high skill, hardly short of genius, simply to let natural landscape successfully alone.

Let the student consider therefore that the natural style in landscape gardening is not to be lightly undertaken. It is a profound art and must be studied long and seriously. Successful practice must be founded upon a deep reverence and love for the native landscape.*

Governing Principles

Rules have only a limited application anywhere in the fine arts. They are especially dangerous in such a difficult and half-understood art as natural landscape gardening. Nevertheless for the guidance of beginners it seems best, after emphasizing these limitations, to offer a series of rules which will at least stimulate the student's observation. The student is therefore urged to follow these rules carefully until he is perfectly sure of his ground before he adopts any contrary methods.

Working Rules

1. Every informal park or garden should be partially or wholly enclosed in order to give it a feeling of unity and sometimes of privacy; but this enclosure need not be so obvious nor so complete as in the formal garden. Good outlooks should be especially preserved. The enclosure will be composed chiefly of borders of trees and shrubs.
2. The main structural features will usually be roads, paths, trails, or navigable waters; and the principal one of these lines will, as nearly as practicable, circumscribe the area under treatment.
3. The principal considerations in locating drives, walks, etc.

* It is impossible in the space of a short chapter to expound fully this natural style. The student is urged to give careful attention to the author's larger work "The Natural Style in Landscape Gardening."

will be (a) the shape of the area, (b) topography, (c) convenience of travel between important points, (d) development of views.

4. To secure unity of artistic effect a suitable motive or theme should be selected and should be adhered to as closely as possible. Under no circumstances should effects at variance with the leading motive be introduced.

5. The successive episodes in the development of this motive will appear at well marked points, which points will all be upon the main structural roads or paths, thus developing the theme in a paragraphic manner.

6. The principal landscape effects will be brought together at these paragraphic points. At these points will occur (a) the principal changes in direction of roads or paths, (b) principal change of grade, (c) change of planting, (d) principal interior or exterior views, (e) but especially the culmination of the motive episode.

7. It is desirable to avoid the use of straight lines and radial curves; but awkward, and unnatural curved or crooked lines must be equally avoided.

Illustration

The example here offered shows a wild garden approximately 120 × 270 feet in size and lying in a ravine at the back of a larger home lot. This home lot is at the top of a bank southeastward from the wild garden into which it merges.

This ravine has a small running brook which has been dammed at the lower end to form an artificial pool. This brook is the leading feature of the area and naturally should be adopted as the principal motive. The banks are well set with good native trees and native shrubbery. There are also many native wild flowers, and more can be introduced. Even the marsh is a delightfully picturesque feature inhabited by red-winged blackbirds.

The comparatively high wooded bank supplies a practicable enclosure with a sense of privacy and unity. (Rule 1.)

The main structural feature is a walk which comes down from

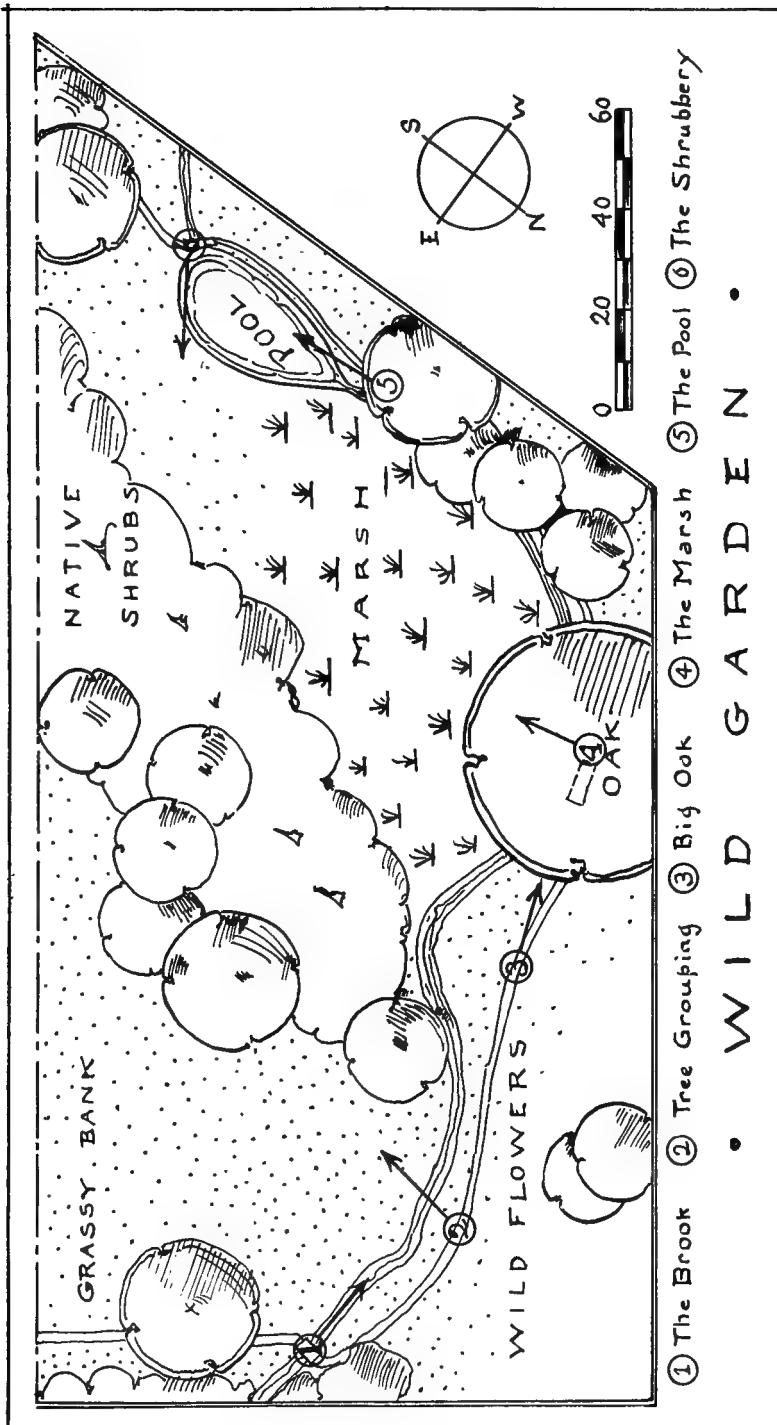


FIG. 78. PLAN OF GARDEN IN THE NATURAL STYLE

the home grounds, follows along the sloping bank of the brook, passes over the dam at the foot of the pool and returns to the garden above. (Rules 2 and 3.)



FIG. 79. GARDEN IN THE NATURAL STYLE --- JENS JENSEN, DESIGNER

The brook and its appendages have been adopted as the leading motive for this wild garden. The path follows in general the course of the brook and all the views and all the plant growth belong naturally to this type of scenery. (Rule 4.)

Six principal views are shown at paragraphic points along the principal walks. (Rule 5.)

Problems

First let the student copy this design in pencil and crayon after the manner shown in Figure 92. He should consider whether the principal views have been properly placed, whether the best views have been chosen, whether any reconstruction (such as the draining of the marsh or the omission of the pool) might work to the improvement of the plan.

Next the student should undertake to discover, define and

describe particular landscape motives in his own neighborhood. When such a motive is found the student should then isolate several episodes (possible paragraphs) showing various aspects of the motive. This sort of practice is suggested further in the lesson entitled "The Landscape Links," Lesson XX, page 800.

After such preliminary study the student should undertake to lay out small tracts of land in the natural style. First attempts should be made upon sections of natural landscape on which only minor improvements will be required. From such problems one may proceed to larger areas, to more varied topography, to more complex motives, and to conditions where a larger proportion of the work has to be done out of hand — where extensive grading and planting operations are involved.

As this natural style covers so large a part of what is popularly understood as landscape gardening it will be well for the student to spend considerable time on this subject, working up several problems.

Readings

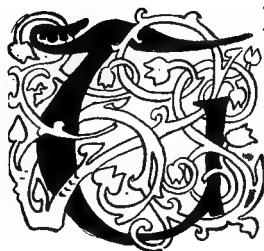
WAUGH, *The Natural Style in Landscape Gardening*.

DOWNING, *Landscape Gardening*.

HUBBARD AND KIMBALL, *Landscape Design*, Part IV.

LESSON 34

FARMSTEAD GROUP



HIS lesson gives the opportunity to study the economic and artistic grouping of farm buildings. The considerations here presented have special reference to conditions existing in the prairie farming states of the Middle West, though to a large extent the same principles should govern the layout of a farm group anywhere.

Definition

For the purpose of this discussion a farmstead is understood to be a group of buildings used upon a farm, with the adjacent enclosures and plantings. These will include farm dwelling house, barns, granaries, house-yard, barn-yard, feed-yards, water supply, etc.

Illustration

The farmstead here shown was designed by Mr. R. J. Pearse, landscape architect, of Des Moines, Iowa, and executed for Mr. W. J. Osgood of Sheldon, Iowa. The following discussion of the principles involved in making such a design is written by Mr. Pearse.

Discussion

The farmstead is the business front of the farming profession. It occupies less space, is more expensive and more productive than any other part of the farm. For that reason there is a greater chance for useless expenditure and diminished returns.

As the most expensive part of the farm, representing a perma-

FARMSTEAD GROUP

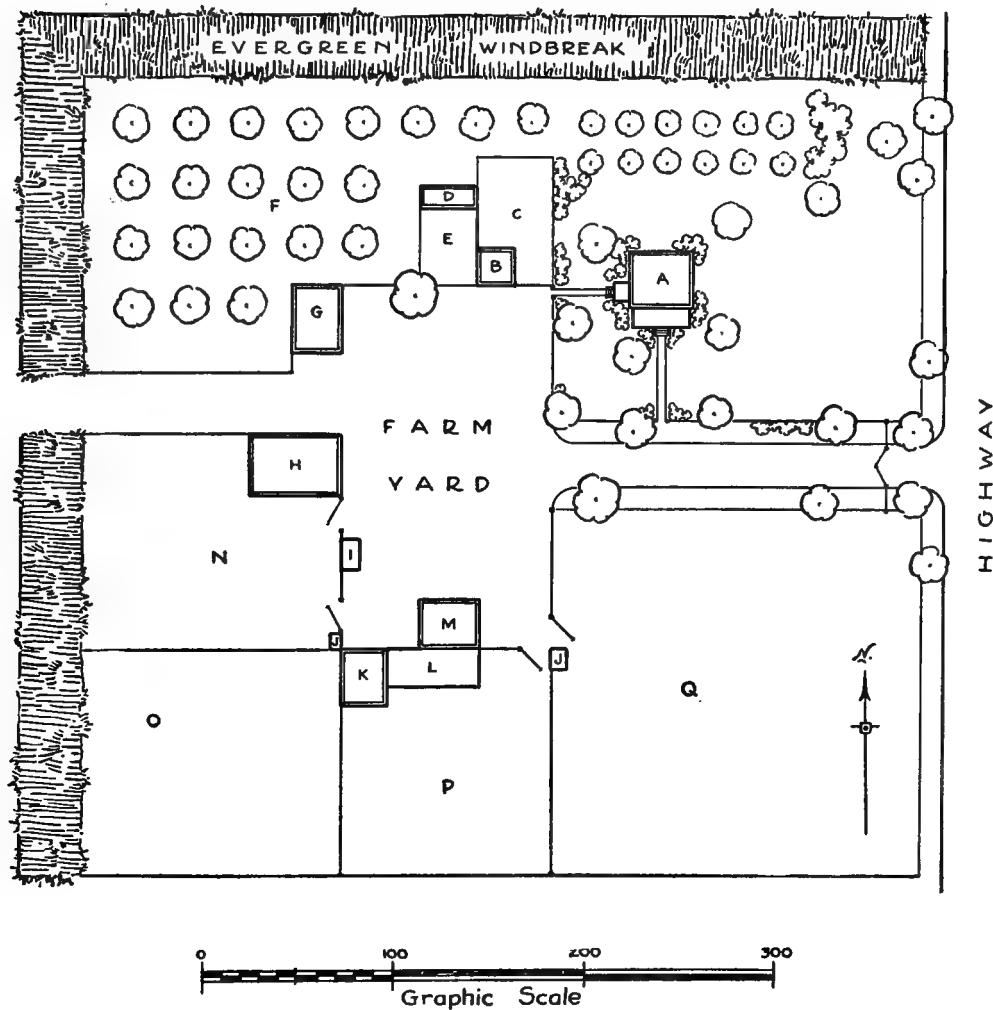


FIG. 80. GENERAL PLAN OF IOWA FARMSTEAD

ment investment, there is all the more reason for the most careful expenditure of money and the most careful planning to reap the greatest returns. Farmstead planning is the scientific arrangement of the different parts which make up the business front of the farm, in such a manner that the greatest returns will be shown in the most economical use of space, the convenience in operating the

farm, and last, but not least, the attractive appearance of the entire layout.

Some of the most essential features which must be considered in planning the location of a set of farm buildings are (*a*) size of farm, (*b*) farmed by tenant or owner, (*c*) probable use as stock, hay, grain or general purpose farm, (*d*) amount to be spent in buildings, (*e*) probable effectiveness of upkeep, (*f*) probable increase or decrease in present size of farm.

The first choice to be made after the general considerations are in mind is that of a proper site for the location of the farm buildings. Because of the close relation which the farmstead bears to the usability of the entire farm, the site must be chosen with the utmost care. This is usually chosen with reference to the proximity to town, school, church and the administrative center of the farm. The best location is at one side of the center of the farm and near the best public highway.

A farmstead should have proper air, light and drainage and not too much exposure to winds. South and east slopes are the most desirable, and a gravel knoll is best for the location of a farmstead because of the advantage to be obtained by thorough drainage and consequently dry feed-yards at all times.

For the general purpose farm, the hollow square or rectangular system of arrangement of buildings is the most satisfactory. It is not unusual to find this system used on the farms of many of the best farmers who have given a great deal of thought and care in the planning of their farmsteads. The hollow square system, as indicated by the name, is built up around a hollow square or rectangle with buildings on three sides, the fourth side opening upon a public highway.

In this system we have three groups of buildings viz:— the house group, the barn group and the feed group, each dominated by the main building in each group, the house, the barn and the elevator. Standing in the public highway facing the location of the new farmstead, keeping in mind the hollow square with buildings

should be not less than 110 feet wide by 120 feet long parallel to the public highway. The barn should be located at the end or side of this farm-yard; in either case it is much farther from the highway than the house. If the barn is at the side of the barn-yard it should be directly in front of the entrance driveway. The end of the barn bearing the hay door should open into the farm-yard in order to avoid opening gates in putting hay in the barn. If this door can be located on the north or east side of the barn it is the most desirable as it avoids the hot sun on summer afternoons.

The elevator or feed building with its companion building, the hog barn, might be located at the left side of the farm-yard. A double elevator with a driveway passing through should be so located that it is possible to drive from the fields between the cribs or granaries without opening any gates.

A cement feed floor beside the elevator is a feed saver and is the best location for self feeders, water tank, etc. A floor on the north side of an elevator should be avoided because of the ice and snow which accumulate there in winter and the dampness at different times of the year.

A hog barn should be located with direct access to the cement feed floor, the feed building and a hog pasture; and especially one entrance door should open out upon the farm-yard to avoid the useless opening of gates.

A machine shed might be located at the corner of the farm-yard near the barn, and a road to the fields might lead between the barn and machine shed, making it easier to place machinery in the shed rather than in a location at a distant point of the farmstead. A small service yard in connection with the machine shed is always desirable to store wire fencing, fence posts, old machinery and other such material. Both the garage and poultry house should be located on the side of the farmstead nearest the house, a door of each should if possible open directly from the door-yard to give ready access from the house.

With the buildings located according to these principles, it will

surrounding, it would be natural to locate the main buildings one at the right, one at the left and the third directly in front of the main entrance. For example if the house is at the right, the elevator at the left, the barn would probably be directly in front. The house should naturally occupy the most advantageous location, not less than 100 feet* from the road and dominating the entire farmstead



FIG. 81. VIEW FROM MAIN ENTRANCE

and also the best views along the highway. A broad roadway not less than 32 feet wide should be the approach from the highway past the house to the farm-yard and should not be located less than 40 feet from the nearest side of the house.

A door yard fence surrounding the house not less than 40 feet from the side and the rear marks the side of the barn-yard proper or the hollow square surrounded by buildings.

The entrance driveway will usually enter the center of the barn-yard on the side next to the road. This will locate the farm-yard regardless of its size. For a quarter section of land, this size

* This distance, viz., 100 feet, is too great for many farms in the eastern States; also for small farms in the fruit regions of Oregon, Washington and California. F. A. W.

be found that in front and at the side of the house opposite from the farm buildings a lawn can be established of reasonable size. Between the highway and the barn and extending parallel to the highway an open area is shown which has its best use as a show pasture. It not only gives a most desirable foreground to the buildings, but it also may act as a living bulletin board with salable live stock pastured there, either for sale or advertising value to be observed by travelers along the highway.

Stock yards adjacent to the barn and hog barn should be of sufficient size to care for the stock that is to use them. They should be of easy access, convenient in feeding, and with convenient easy operating gates opening from one to another. A small farm orchard near the machine shed and reasonably close to the poultry house is very desirable. A farm vegetable garden should be located near the house with one entrance gate leading directly from the door-yard.

A few well placed permanent shade trees should be planted near the house in order to shade it and the lawn but not to obscure desirable views of the highway. A permanent evergreen windbreak protecting the sides of the farmstead from the prevailing winds is always desirable.

In general, farm buildings should be located so their long axis runs north and south in order to give the best ventilation and sanitation by the sun shining on either side at different times of the day.

The following suggestions should be kept in mind as necessary considerations in planning any farmstead:

1. Entrance drive should strike at some good building.
2. House itself should be placed so that one room at least will command the view of the entire barn-yard.
3. Barn-yard group should be farther away from the road than house group.
4. Barn-yard group should be rectangular in form, with buildings arranged around a court with their backs opening into the several yards.

5. Feed buildings (elevator or corncrib), should be placed between buildings needing the feed for animals housed in them.
6. Water tank, machine shed, horse barn and entrance to fields should be close together.
7. Barn should be 150 feet or more from the house.
8. Barn and hog house should not be too far from the house, in order to more easily care for young stock in cold weather.
9. Ventilation in summer is just as important as protection in winter.



FIG. 82. VIEW OF RESIDENCE AND GARAGE

Study

The pupil should give careful study to the foregoing discussion in order to understand clearly the reasons for each step in farmstead planning. Should these studies be taken up in any school or college where farm management is also taught it will be desirable to correlate this lesson with the instruction given in farm management. The design of the farmstead, like any other problem in landscape garden-

ing, cannot be worked out unless all practical requirements are fully met. Obviously these requirements cannot be adequately met unless they are clearly understood. In short it will be necessary, in order to achieve the best results, for the designer to have a comprehensive knowledge of farm practice. To this he should add an equal understanding of the principles of design, i.e. the principles of landscape gardening.

Problems

After the pupil has completed the preliminary studies recommended above he should experiment extensively in the effort to apply these principles under different conditions.

Problem 1. The plan of "Welworth" here reproduced should be redrawn to a large scale, preferably 1" = 10'. This drawing may be made on cheap detail paper with coarse black pencil and may be finished with colored crayons. Or it may less desirably be drawn upon a blackboard. The large drawing is then to be used for purposes of critical discussion in which the teacher and several pupils should join. If one or more practical farmers can be brought into the discussions of the regular pupils there will be an added interest.

In this discussion every point should be challenged and all possible alternatives considered. Questions like the following should be pressed home: Is the barn-yard too large? Large enough? Is the house too close to the road? Too far from the barn? Has the best location for the garage been found? Has the barn the best possible orientation? Will the yards have proper drainage? Etc., etc., etc.

Problem 2. Visit some good farm and make a detailed measured map of the existing farmstead. Draw this out to same scale as the plan in problem 1, in order to facilitate comparison. Place these two plans side by side, and consider in detail whether No. 2 is better or worse than No. 1. What are the most palpable faults of No. 2? What alternations could advantageously be made?

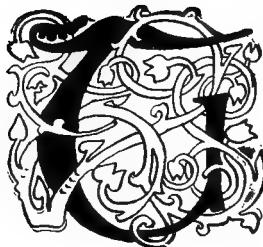
If there are several pupils in the class they should map several

different existing farmsteads in this way, and all these various plans may be brought into this discussion.

Problem 3. Select a farm not fully or properly equipped with buildings. After careful examination choose a site for a farmstead, comparing point by point the alternative possible sites. Survey the tract of land thus chosen, draw out the survey to a convenient scale, probably $1'' = 20'$, and on this survey design a complete farmstead adapted to the needs of the farm.

LESSON 35

NEW ENGLAND FARM GROUP



THE object of this lesson is to extend further the study of the grouping of farm buildings. In the present lesson a somewhat different type of grouping is presented, based less on theoretical considerations than on long practical experience.

The typical New England farmstead consists of a group of buildings connected in a long line running east and west, facing south. The dwelling house is placed next to the public road, back of this comes a kitchen wing, then a wood-shed, then wagon-sheds, after which follow tool houses and other buildings, the line commonly terminating with a large barn.

Example

The example here illustrated, plate 83, presents an actual survey of an existing farm group in Amherst, Mass. It should be studied in careful comparison with the middle-western farmstead illustrated in Lesson 34, and it should be borne in mind that the present layout represents a gradual development covering approximately 150 years, whereas the farmstead plan shown in plate 80 represents a modern plant built to order under the direction of a trained landscape architect. Even under these circumstances it will appear that this New England layout is not badly adapted to governing conditions.

Discussion

It will be seen that the dwelling house is placed much nearer to the road than recommended by Mr. R. J. Pearse for Iowa conditions (see page 149) and that the entrance drive also runs much nearer to the house.

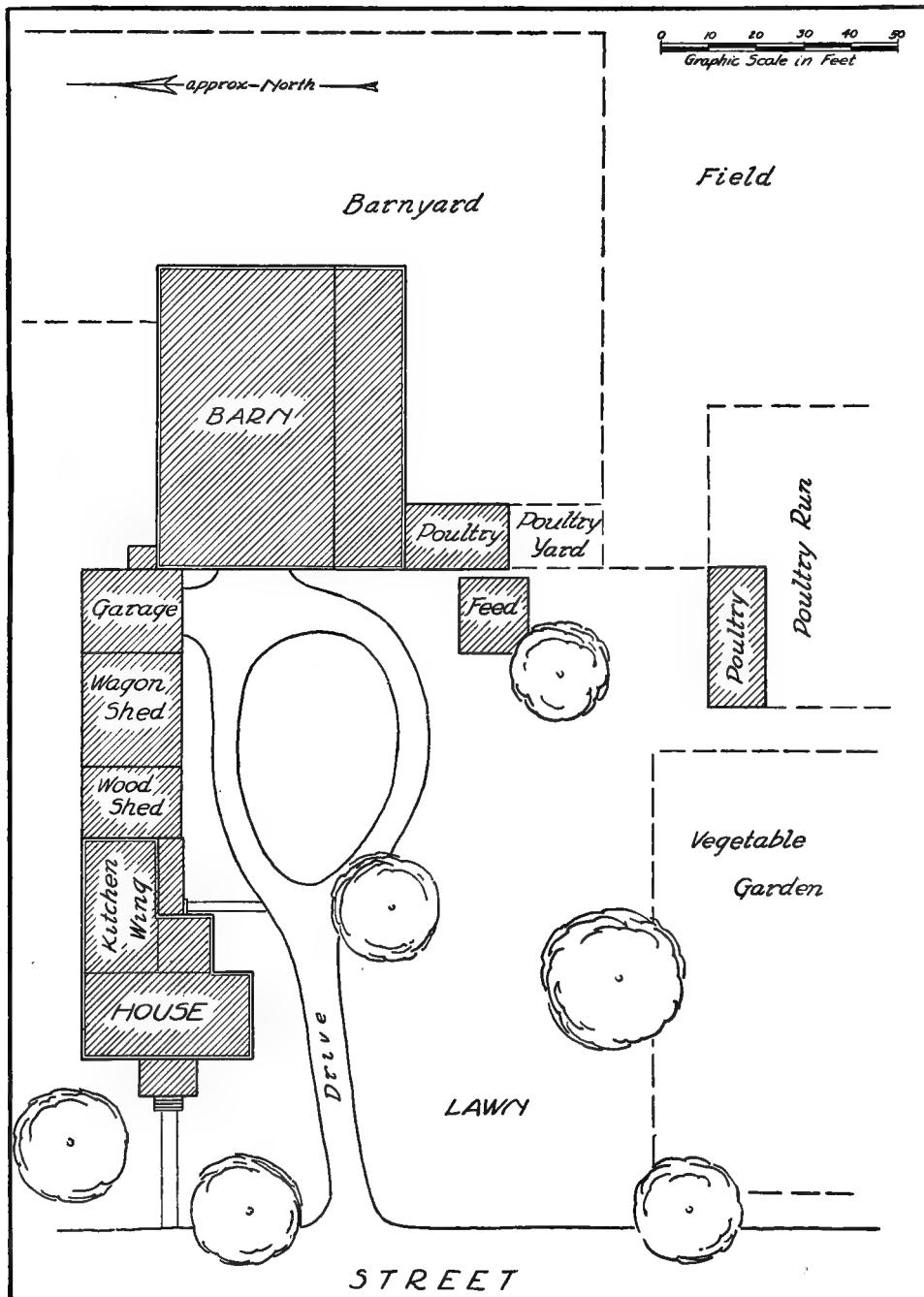


FIG. 83. TYPICAL NEW ENGLAND FARM GROUP

The entire arrangement of buildings is exceedingly compact, thus securing some economies in construction and much more important economies in handling the daily farm chores.

There are some drawbacks to this very compact arrangement. The ones usually mentioned are first the additional risk of fire: if a fire starts in one building it is almost certain to carry off the entire group. A second objection is that the house is too close to the barn, so that flies and the barn smells cause discomfort in the dwelling house. The latter objection, however, may be as readily overcome in this grouping as in any other.



FIG. 84. VIEW FROM THE SOUTH — COMPARE WITH PLAN

Observation

It will be noticed that the primary line of buildings in this case has been returned toward the south from the barn, and that the latest poultry house even returns slightly westward, thus breaking somewhat the original linear arrangement and approximating the quadrangular group recommended and illustrated in Lesson 34.

Problems

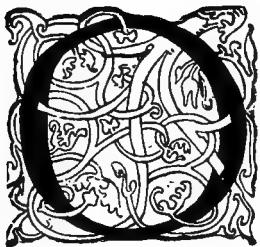
If typical linear groupings can be found in the neighborhood each student should make actual surveys of existing groups. These surveys should be mapped to a uniform scale ($1'' = 10'$ is suggested) and these layouts made by different members of the class should be exhibited together and criticized in detail in comparison with each other and with ideal standards.

Class criticism should be directed further to a very thorough comparison of the merits of the linear group with the quadrangular group.

Finally the pupil should design one or more entirely new groups of farm buildings based on the principle of linear arrangement. If possible these designs should be made for known farms where the actual farming requirements are understood.

LESSON 36

FARMSTEAD LAYOUT



NE more lesson is here given to the subject of farmstead planning. In this lesson a purely theoretical layout is presented. This will enable the student to observe even more closely that in the two preceding lessons how the principles of landscape gardening should be applied to the grouping of farm buildings.

Illustration

The example here illustrated was worked out by Professor Phillip H. Elwood Jr., then of the Massachusetts Agricultural College, now of Ohio State University. The area represented is practically level land, with the public road at the north of the buildings, an arrangement which is usually desirable in spite of popular prejudice to the contrary.

The general plan of arrangement is that of a rectangle, as recommended by Mr. Pearse (page 148). The dwelling house closes the front of this rectangle. The main storage and stock barn stands on the opposite side of the quadrangle; while minor buildings close the eastern and western ends.

It will be observed that the entire arrangement is somewhat more compact than the design for "Welworth" shown on page 147. Space is economized especially in the grounds immediately contiguous to the dwelling house; the house is placed much closer to the road and the entrance drive much closer to the house. Such an arrangement seems to be more favored in the eastern states at the present time, whereas the larger front-yard as developed at "Welworth" seems to represent more nearly the popular ideal in the

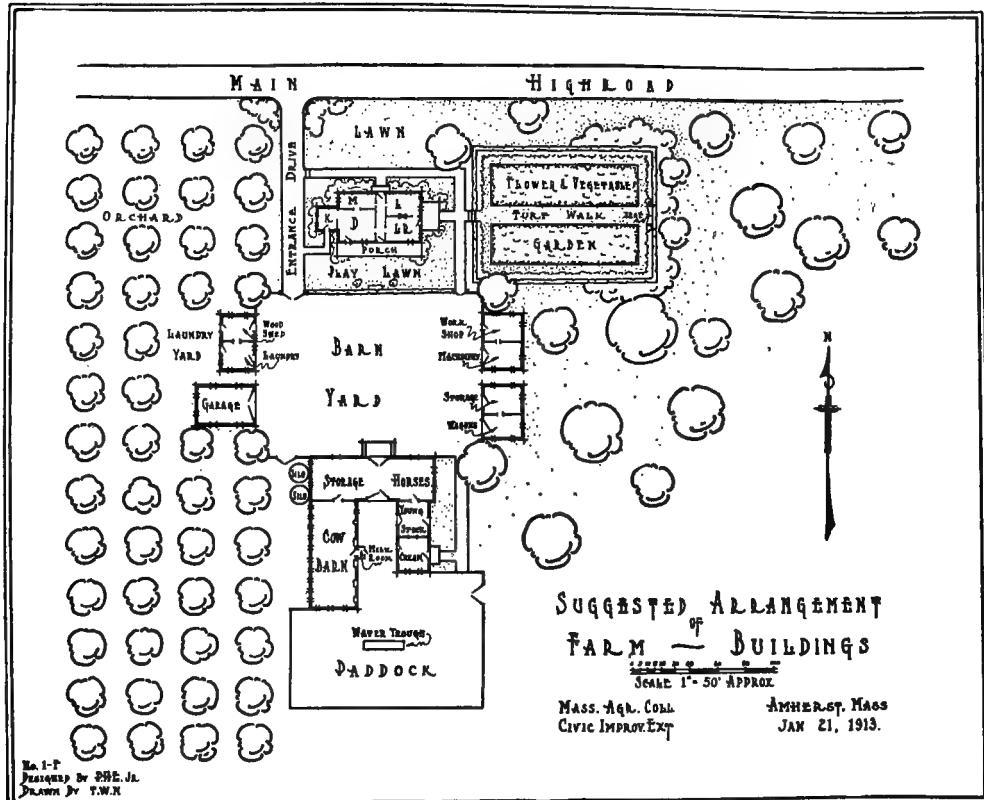


FIG. 85. IDEALIZED FARMSTEAD

middle west. Either disposition is perfectly legitimate from the standpoint of landscape design.

The present design shows the flower and vegetable garden arranged in compact formal style at the west end of the house and connected with it by a short path. Such an arrangement would give a pleasant outlook from the house and should prove an attractive feature on any well-kept farm.

Problems

The student should copy this design at a scale of $1'' = 20'$. The copy may be made in pencil and colored in crayon, or rendered in some other medium if preferred.

It is important to compare this design in detail with the others already presented in Lessons 34 and 35 and to consider critically the validity of each suggestion offered. For example, are the milk and cream rooms placed in the most advantageous position? Is the woodshed too far from the house? Are the laundry and laundry yard too far from the house? Is the area marked "play lawn" and separated from the barn-yard by a hedge a practical feature? Would it be better to relegate the vegetable garden to another location on the farm where it could be cultivated with a horse cultivator?

The student should also undertake for himself to work out original designs in this quadrangular method. This may be done first for purely imaginary grounds, but it is better finally to make such designs for given farms where the topography can be surveyed and all the conditions known.

Readings

ROBERTS, The Farmstead, Chap. VI.

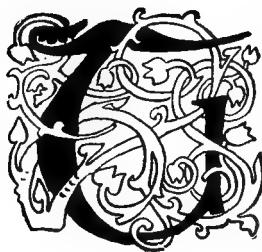
DAVIDSON, Agricultural Engineering, Chap. 62.

WARREN, Farm Management, pp. 388-401.

U. S. Dept. Agri. Farmers' Bulletin, 1132. Washington, 1920.

LESSON 37

OUTDOOR THEATER



HIS exercise will give the pupil an opportunity to learn something of the design and use of outdoor theaters. Such open-air auditoriums are made in a great variety of styles, in all sizes, and are used for innumerable purposes, such as giving plays, pageantry, music, religious meetings, public speaking, movies, vaudeville, etc., etc.

Discussion

The simplest outdoor theater is found where the boy scouts sit round in a circle while the scout master stands in the center to address them. From this point upward the idea may be elaborated to any extent, some of the notable examples being the college stadiums, like the Yale "Bowl," which has been used for music and pageantry as well as for great spectacles of football; the beautiful high school "Bowl" in Tacoma, Washington, and the famous "Greek" theater at the University of California.

Outdoor meetings are very common in all parts of the country, but in ninety-nine cases out of a hundred these are held in improvised surroundings — a few planks laid across boxes under the trees with a bigger box to serve as a rostrum for the speaker. Now the proper procedure in landscape gardening is to provide comfortable and beautiful surroundings to meet the needs of these gatherings rather than to build some elaborate theater and afterward try to invent a use for it. Of course a theater once built, if it is suitable and appealing, will create new demands. There will be more outdoor concerts, more open-air church services, more grange picnics, more neighborhood reunions.

OUTDOOR THEATER

The following suggestions as to the design of outdoor theaters are condensed from the author's work on this subject.*

Size: Generally speaking the outdoor theater ought to be large or small, one or the other. The football stadium has to be large enough to accommodate thousands of visitors; a theater for pageants must also be made on a large scale. But for small plays, for music and for public speaking the outdoor theater may easily be too large. For these latter requirements it should be as small,

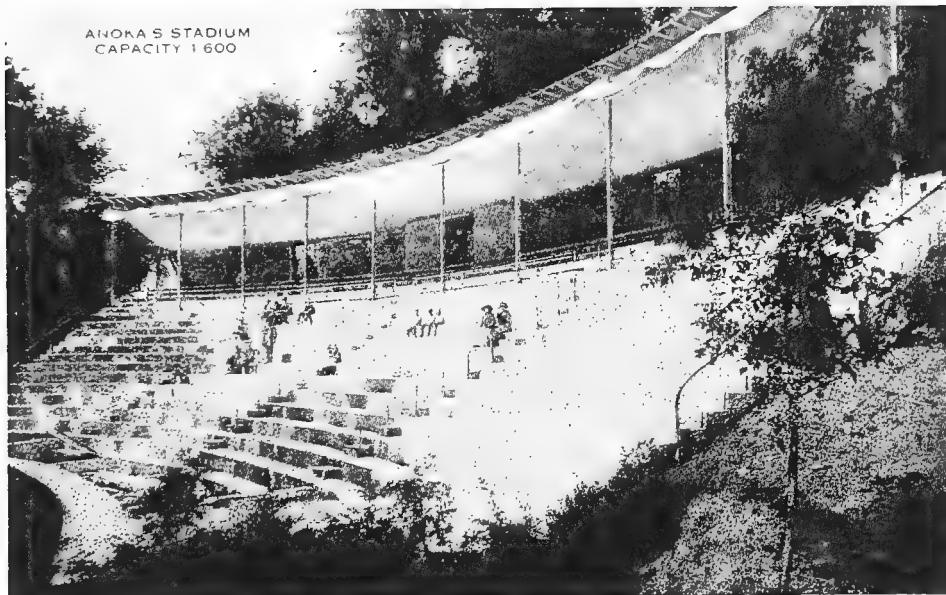


FIG. 86. OUTDOOR THEATER AT ANOKA, MINN.

compact and intimate as possible. Rarely should it be designed to seat more than 500. If 200 auditors are well cared for it will be even better.

Enclosure: Every outdoor theater ought to be fully enclosed, preferably by trees and shrubs or by hedges of greenery. Boundaries of dressed and painted lumber or of stucco or brick can be made attractive if well designed and especially if well covered with vines.

* Waugh, "Outdoor Theaters," Boston, 1917.

Orientation: It is best to have the main axis of the theater run approximately north and south with the stage at either end of this axis.

Locations: Large theaters and football stadiums must be in the open and preferably on level land. Rarely, as at Tacoma, Washington, can advantage be taken of a hillside to make a thoroughly satisfactory stadium. Small theaters should be made under trees in nearly all cases. "Natural amphitheaters" of which one often hears are really quite common. They can be found in almost every neighborhood, and they should be utilized wherever possible as sites for further elaboration.

Seats: There has been a wild fashion in America for fitting all stadiums and outdoor theaters with cement seats. Now a cement seat is intolerable for purposes of sitting down. Wooden seats must always be built on top of the cement. This raises the question whether it is not much better, at least in small theaters, to build wooden seats in the first place. In some places chairs may be brought out when needed. In many instances temporary and moveable planks make the most practicable seats.

The Stage: The stage should be as simple as possible, usually level; and not too large. It should be closed at the back and framed in at the two sides by trees, pillars, or by some similar means. Convenient exits and entrances should be found, and dressing rooms must be considered.

Lighting: Electric lighting is the simplest method almost everywhere, but by no means the best, especially if the usual incandescent bulbs are strung in sight of the spectators. If "flood lights" thrown from concealed sources can be installed the outdoor effect is better preserved. But incandescent light bulbs out of doors are a highly artificial anomaly and tend powerfully to destroy the very illusions which we are striving to create. Open blazing flambeaux, kerosene or gasolene torches, are much better. Good moonlight is best of all, at least for musical programs.

OUTDOOR THEATER

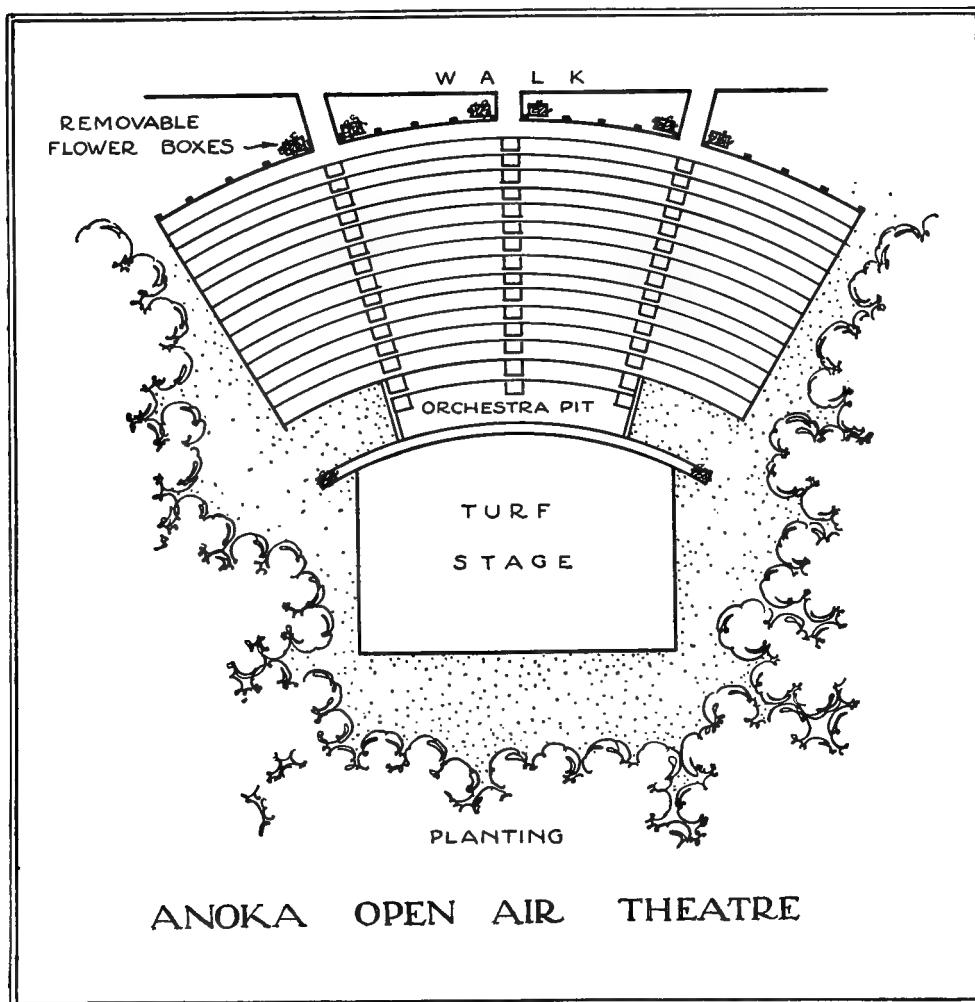


FIG. 87. PLAN OF OUTDOOR THEATER IN ANOKA, MINN.

Illustration

The outdoor theater here illustrated was designed by Purcell and Elmslie, architects, of Minneapolis, Minn., and built at Anoka, Minn., in 1915. It is pictured and described in the book on "Outdoor Theaters" already mentioned.

Problems

The pupil should copy the drawing here used. The copy should be in ink at a scale of $1'' = 10'$.

Next an original design should be made for a small outdoor theater. A suitable site should be chosen, and to this choice of site much study may well be given. Attention should next be given to the uses to which the finished theater may be devoted. When these purposes are clearly in view and all the physical conditions fully understood and a survey made of the ground, the design may be worked out. All details of grading, planting, stage, furnishings, seating, lighting, etc., should be fully developed.

Readings

“Open-air Theaters,” *Independent*, 64 : 1362, June 11, 1908.

“Beauty in Outdoor Drama,” illus. *Craftsman*, 18 : 570, Aug., 1910.

MACKAYE, *Outdoor Plays and Pageants*, illus. *Independent*, 68 : 1227, June 2, 1910.

Row, *Open-air Theaters in America*. *Harpers Weekly*, illus., Oct. 4, 1913.

STOLL, *Where Theaters are Out-of-Doors*, illus. *Tech. World.*, 20 : 403, Nov. 1913.

“Theaters Roofed by the Stars,” illus. *Lit. Digest*, 47 : 20, July 5, 1913.

HUBBARD, *Italian Garden Theaters*, *Landscape Architecture*, 4 : 53, 1914.

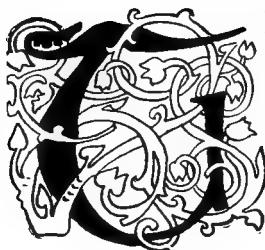
“Garden Theaters,” illus. *Country Life Am.*, 27 : 43, 1915.

WAUGH, *Some Garden Theaters*, illus. *Architectural Review*, 4 : 161, Sept., 1916.

WAUGH, *Outdoor Theaters*, illus., pp. 151, Boston, 1917.

LESSON 38

CHURCH GROUNDS



HIS exercise presents another type problem in landscape gardening as applied to civic improvement. The student should get some practice in drafting from this lesson, but his attention should be turned chiefly to the principles on which an existing design has been revised.

Illustration

The drawing herewith presented shows a design for the improvement of existing church grounds. The present layout may be seen in the paced survey shown on page 32, and that survey must be consulted in the study of the present lesson. In the existing layout two serious defects appear (1) the entrance is irregular, blocked, "blind;" (2) the plantings are scattered, miscellaneous and aimless.

The front door of the church is not now visible from the street, but is hidden behind high and dense shrubbery, and the approaches are crooked, unsymmetrical and ugly. A stranger would hardly find his way into this church without a guide, whereas the church would like to appear particularly inviting.

In the revised plan the front porch and door have been opened to full view. The large (existing) elm in the center is high-branched and does not in the least obscure this view.

A main feature of the new plan is a large paved concourse in front of the porch. Seats are set along the margins of this concourse. The purpose of this feature is to invite everyone to linger for a few sociable moments with friends either entering or especially on leaving church.

The broad plaza and broad, direct walks are expected to open

DESIGN FOR IMPROVEMENT OF CHURCH GROUNDS

graphic scale

0 50 100 150 FT.

THE CHURCH

approx. 4400 sq. ft.

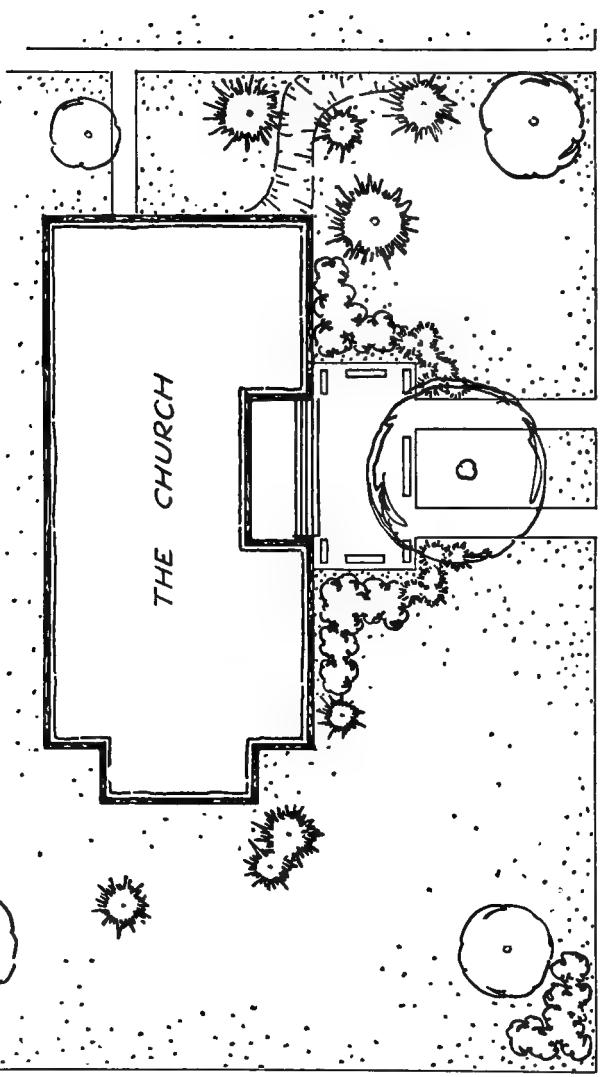


FIG. 88. DESIGN FOR IMPROVEMENT OF CHURCH GROUNDS

the way widely to the church; to make it easy for strangers to find their way in.

The plantings about the church yard have been grouped and simplified. The concourse is supported on the sides with masses of dense, neat shrubbery, including deciduous and evergreen species.

Problems

This plan should first be redrawn on a scale of $1'' = 20'$. This drawing should be in ink, or may be rendered in water color.

The student should then make a paced survey of some neighboring church grounds, and on the basis of such survey should prepare a plan of improvement. This plan should be as simple and direct as possible. It should be drawn in ink at a scale of $1'' = 20'$.

The several members of a class should generally cover several church yards in these studies. The resulting improvement plans should be brought together for comparison and criticism.

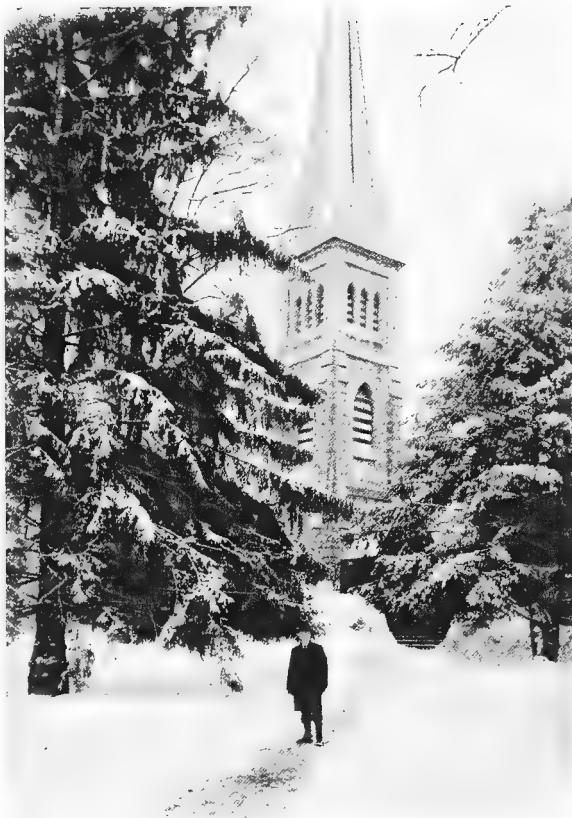
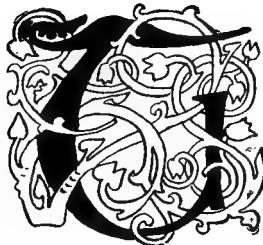


FIG. 89. CHURCH GROUNDS — EXISTING ENTRANCE

LESSON 39

RAILROAD STATION GROUNDS



HE purpose of this lesson is to exhibit the problems which arise in the layout of the grounds about the average rural railroad station and to present some of the considerations upon which a solution of these problems may be based.

Discussion

The average rural railway station grounds comprise always the following units:

- (1) Tracks
- (2) Sidings
- (3) Station buildings
- (4) Platforms
- (5) Vehicle approaches
- (6) Foot approaches
- (7) Traffic space

To these may be added in special cases various other items such as

- (8) Separate freight station
- (9) Water tank
- (10) Coal bunkers
- (11) Cattle yards

Every satisfactory station grounds also has some relief of trees and shrubs, grass or parkings. In securing a satisfactory effect, from the standpoint of civic art, these ornamental features are highly important

Structural Design

It is evident that these various units can be arranged in an infinite variety of combinations. Obviously the simplest, most straightforward, most logical arrangement is to be desired.



FIG. 90. WELL-TREATED RAILROAD STATION GROUNDS

It seems clear from an examination of hundreds of examples that no general type of plan exists, at least in the eastern states. It might have been expected that the railroads would have standardized the plans of their rural station grounds. It seems that none of the eastern railroads has done anything of this sort, but by no means clear that such a standardization of station grounds plans would not be preferable to the hap-hazard developments of the past. It would seem, however, to the average landscape architect that still better results could be secured by a careful study of each case on its own merits. Such study would begin with a consideration of local geography, specifically with the problem of adjusting

the station grounds to the adjoining streets in such a way as to make the station most readily accessible from business districts, residence sections, and surrounding farming country.

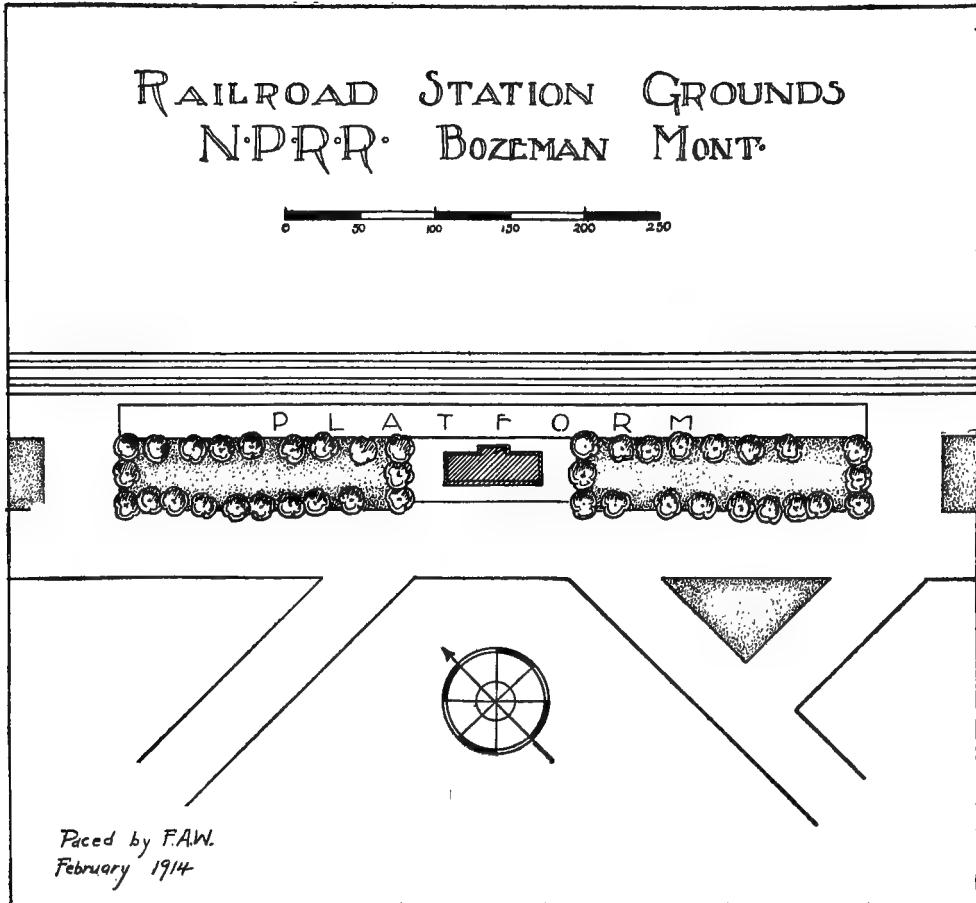


FIG. 91. SIMPLE LAYOUT OF RAILROAD STATION GROUNDS

Next there should be considered questions of local topography in order that the whole design may be properly fitted to the land.

There would then be considered the architectural character of the station building. This should be simple, and the coloring should be in a quiet neutral tone.

Lastly, but by no means least, should be considered the orna-

RAILROAD STATION GROUNDS

mental treatment of the grounds. The importance of these grounds is readily conceded when we consider the civic character of the railway station as a principal community entrance. The railway station, being the front door to the neighborhood, should have the same artistic qualities as the front door of a public building or private residence. Briefly stated these requirements are as follows:

- (1) Practicable traffic connections
- (2) Orderly arrangement
- (3) Cleanliness
- (4) Dignity
- (5) Hospitality

In short, the station grounds are to be made inviting. To give them the required dignity and attractiveness some use of trees and grass is to be strongly urged. Any elaborate gardening with tender herbaceous stock is generally inappropriate at a rural railway station where practically no funds are available for maintenance. It may be doubted whether plantings of shrubbery are desirable unless some definite provision can be made for up-keep.

In general the great need in the design of rural station grounds is for an orderly and logical arrangement of the various units.

Illustrations

The examples here reproduced are drawn from paced surveys of existing railway grounds.

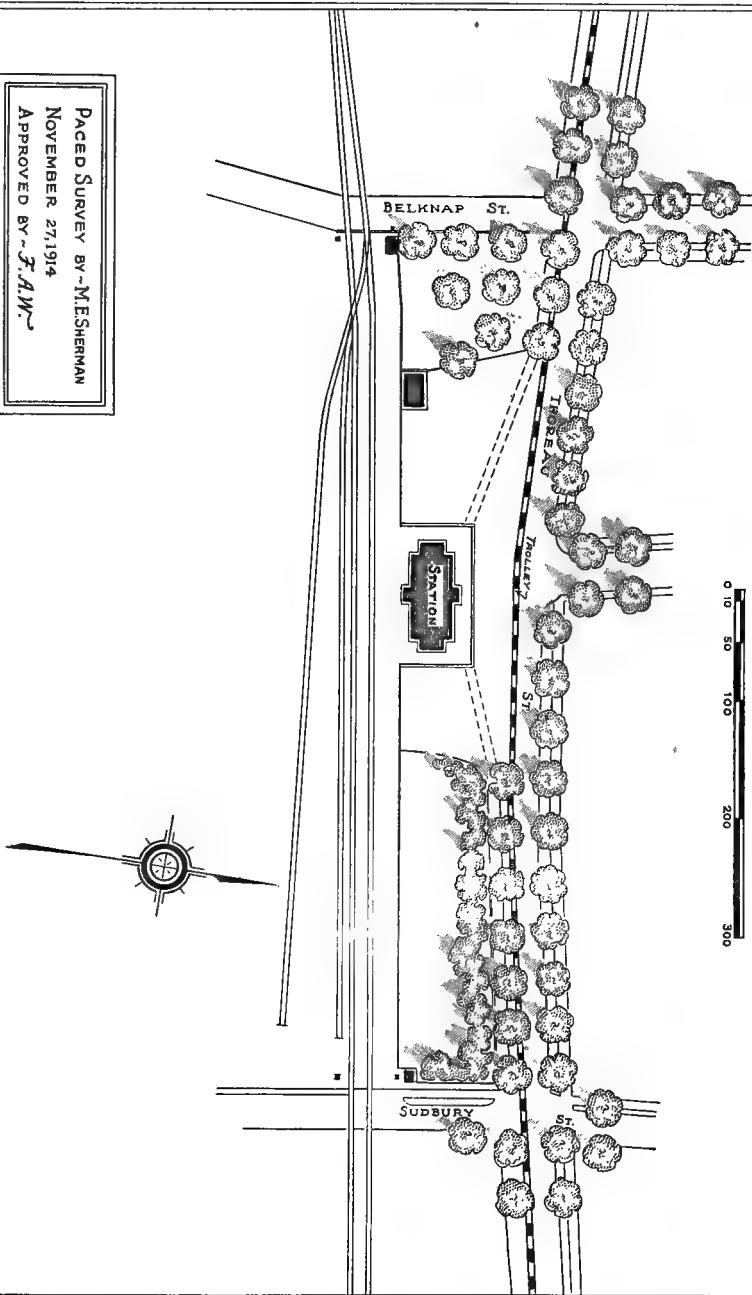
Problems

The pupil should redraw one of these plans in ink at a scale of $1'' = 40'$. This will give opportunity for a more careful consideration of the problems involved.

Next the pupil should make a paced survey and map of some rural or suburban station grounds somewhere in his own neighborhood. If there be a class of several members as many different grounds should be surveyed as can be reached. A comparison of the

~ RAILROAD STATION GROUNDS ~
~ B. & M. R. R. CONCORD, MASS. ~

PLACED SURVEY BY -M. E. SHERMAN
NOVEMBER 27, 1914
APPROVED BY -F. A. W-



RAILROAD STATION GROUNDS

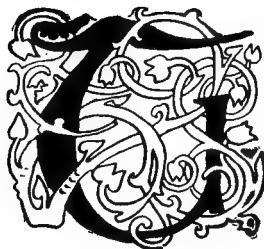
way in which problems have been met in different places should prove interesting and instructive, and for that purpose the surveys collected by the members of the class should be brought together for exhibition and discussion.

Next the pupil should undertake the revision and improvement of plan for some existing station grounds where he is personally acquainted with conditions.

Lastly, if time permits, the pupil should attempt an ideal layout such as might be adopted as a standard by a railway company.

LESSON . 40

COURT-HOUSE SQUARE



HE purpose of this lesson is to indicate the most effective lines of development in a court-house square, a civic feature of large importance in county seat towns, especially in the south and middle west.

Discussion

The court-house square usually occupies a central position in the town, and the court-house itself is apt to be the largest and most important public building. The court-house square thus becomes the focus of civic interest — a genuine civic center.

The grounds in the court-house square will necessarily be relatively small. This results primarily from the heavy pressure of commercial interests on the four sides of the square, since as a rule the most valuable business locations are those immediately fronting upon the court-house. The actual and apparent size of the grounds are still further diminished by the large mass of the court-house building.

It sometimes happens also that other buildings are put upon the court-house square, such as a jail or a library. Such an arrangement must always be considered objectionable. Such other buildings break up the ground and detract from the dignity of the central court-house.

On account of the smallness of the grounds and the predominance of straight lines in the vicinity, a definitely formal treatment of the open spaces is strongly suggested. Good landscape gardening would undoubtedly lead in this direction. The public taste for a more natural style is so strong however, and the popular ignorance

COURT-HOUSE SQUARE

of the formal style so great, that the prevailing tendency is strongly established toward a park-like treatment. This park-like treatment in its best form involves the following features:

1. Rather extensive plantings of hardy native deciduous shade trees. These should be placed around the borders of the lot, the spaces in the center and about the building being left free of trees.
2. Development of good lawn areas. Such lawns can be established only where the ground is free of trees.
3. Foundation plantings of hardy shrubbery and evergreens about the building.
4. The placing of attractive lawn benches at appropriate points, especially along the marginal sidewalk under the shade of trees and facing the walk.
5. The exclusion from the grounds of trite and silly "ornamental features," such as cast-iron statuary, memorial statues of local heroes, antiquated artillery, unnecessary fountains, pattern flower beds, and all similar rubbish so dear to the heart of the average court-house janitor, the sheriff and the board of county commissioners.
6. Walks should be direct from the court-house entrances to the principal traffic points. These principal traffic points are nearly always at the corners of the square, so that a system of diagonal walks is almost necessary.

Illustration

The example here reproduced is a typical court-house square from Marshalltown, Marshall County, Iowa, and is drawn from a survey by Professor Frank H. Culley, landscape architect.

Problem

If the student has time he should first redraw the plan of the Marshalltown court-house square as here shown.

The next step must be to survey the nearest court-house square and present the findings in the form of a drawing similar to that

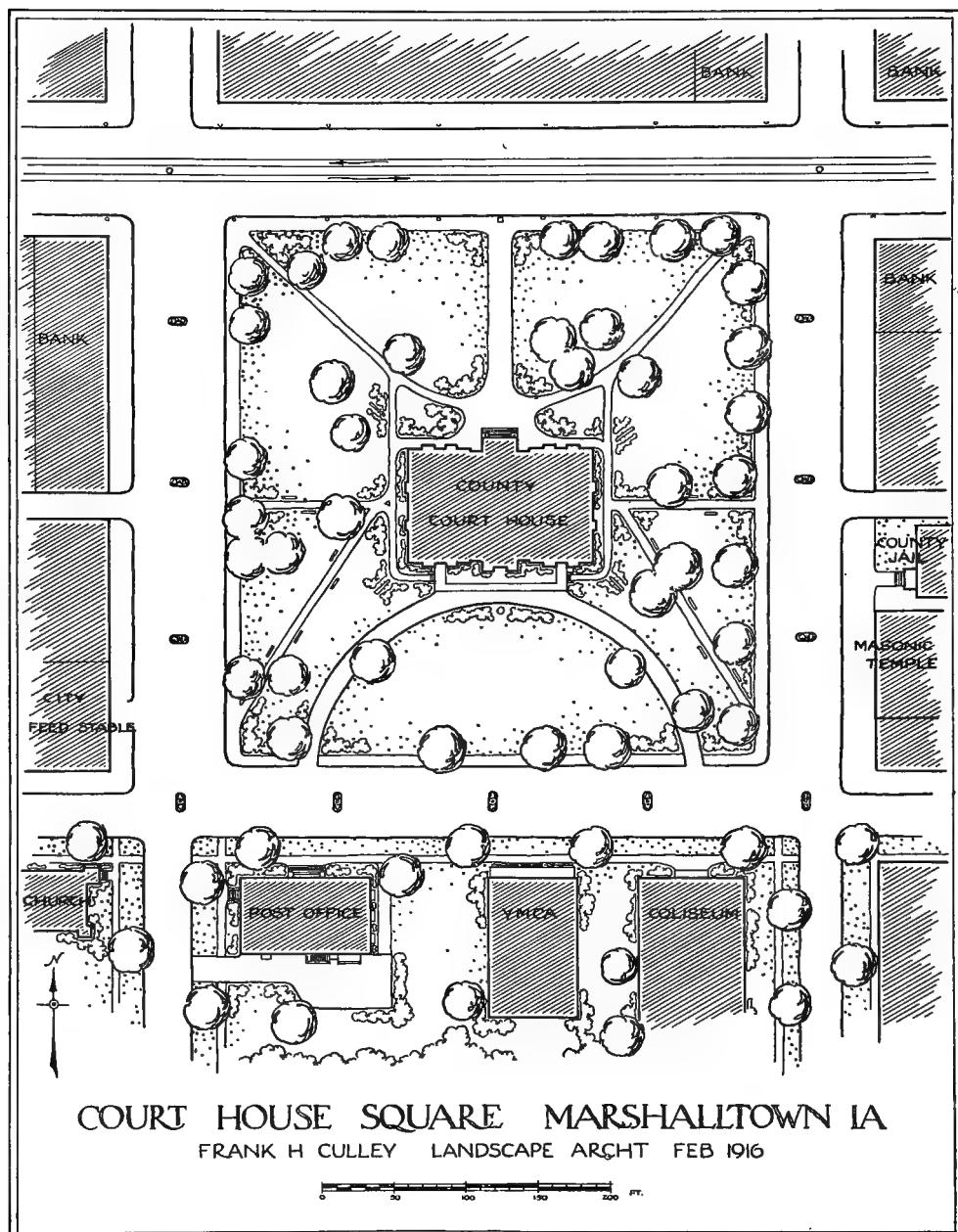


FIG. 93. TYPICAL COURT-HOUSE SQUARE

COURT-HOUSE SQUARE

shown in Figure 93. The layout thus discovered should be criticized in detail as to location of walks, character of plantings, position of benches, condition of lawn, and all other features. Such criticism should be constructive, showing how better results could be achieved.

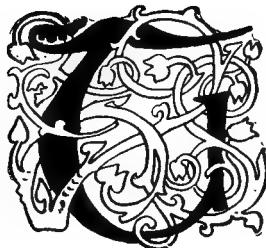
Finally the student should prepare an improvement plan, preferably based upon the survey already made, showing how an ideal court-house square should be developed under the circumstances thus made known.

Questions

1. When a court-house and grounds are outgrown how can extensions or enlargements be made?
2. How might this exigency be provided for if it were foreseen from the beginning?

LESSON 41

TOWN COMMON



HE object of this lesson is to study the town common, a civic feature of first importance in New England villages. It is desirable to know something of its history and uses in order that appropriate plans may be made for its present improvement. We should also have in mind the possible development of the same idea, perhaps with some modifications, in other parts of the country and in new communities now building.

*General Discussion**

One of the most pleasing features of the New England village is the town common. It is also one of the most characteristic, for while there are "court-house squares" and "parks" in most of the southern and mid-western towns, these are physically and politically very different from the New England town common.

Public interest in the common may be safely reckoned on in every New England town. As the village is the center of commercial and social intercourse, so the common is the center of civic interest. Village improvement nearly always begins with the town common.

Historical Notes

Existing town commons are mostly rather old — at least not of recent origin. The purposes for which they were set aside have

* This discussion is revised from a bulletin by the Author, "The Town Common," Massachusetts Agricultural College, Extension Bulletin 7, June, 1916.

now generally disappeared, and may be entirely forgotten. In a number of instances they were simply common pasture lands on which livestock could be kept, and especially on which the livestock might be assembled at night so that they would not be run off by the Indians. The idea of providing a central parcel of ground for such common use was undoubtedly the primary purpose in a large number of cases.

A little later came the use of the common as a military drill ground. Military service was practically universal and military practice frequent. On training days the common was the center of animated doings. Add a lot of gay flirtation and hard drinking to the military manoeuvres and the picture gains in truth and completeness. This use of the town common diminished rapidly after 1812, but was revived again in some places in 1861.

Historically the next use to which town commons was generally given was the local fair or cattle show. In a very few instances the annual fair still uses the common, though under increasing protest.

At the present time public sentiment has quite other ideals as to the purpose of the common, though these ideals are seldom as clearly formulated as might be desired. The common is understood to be a sort of sacred ground, though nobody may be able to tell why nor for just what uses it is reserved.

First of all the modern town common is a civic beauty spot. Nothing adds charm, dignity, and distinction to the New England town more emphatically than a good, well-kept common. While many persons affect an attitude of indifference to a mere question of looks, all good citizens really have a very substantial pride in such matters. Everybody likes to have his home town appear to good advantage in the eyes of visitors, and indeed most men and women find for themselves a real personal satisfaction in the attractiveness of their home surroundings.

The common has become, in a majority of towns, a modern civic center. The principal civic buildings, such as the town hall,

the popular churches, the library, the school, the grange hall, the post office and the stores, front upon it. This grouping of public and semi-public buildings within a single view and fronted by an open space of grass and trees is precisely the arrangement best calculated to give the finest possible effect. At the same time it contributes best to practical convenience.

The practical purpose of the town common in present times is, therefore, to beautify and dignify the civic center, as well as to make it more convenient. As far as practicable all the important public buildings should face on this open space. In a few (mostly quite rural) towns the common is now used as a public playground. It may even support a full-sized baseball diamond. While it is certainly better to permit play on the town common rather than to make no provision whatever for it, this is quite as certainly not the best arrangement, either for the playground or for the common.

Typical Forms

Looking over any considerable number of town commons we see that they have developed chiefly in three principal forms. The first and most frequent is the *triangular* type, formed between the branches of two converging roads. The second is the *quadrangular* type, with more or less definite right angles, formed between four intersecting streets. The third is constituted of a *wide, long street*, having rather indefinite termini. The famous streets of Old Hadley and Northfield, Mass., are good examples of the last-named type, which is more frequent than is generally supposed.

These old commons vary considerably in size, running from one-quarter acre up to eight or ten acres. The triangular ones are usually the smaller. Two to four acres may be considered typical and satisfactory. Less than two acres is inadequate, — more than four is seldom put to effective use.

Modern Treatment

Any appropriate treatment of the town common must develop from its present purpose and modern uses. If it is to be used for cattle shows or military drills there will be little difficulty in modeling the common to meet these requirements. If, however, the much more usual purpose prevails of keeping the common as a civic center for the sake of the beauty and dignity which it may add to the community, a different method of treatment is desirable. This treatment for what must be considered the typical town common may be briefly stated as follows:

1. Buildings of every sort must be kept off the common. There is a constant demand, especially where a large common exists, for the location of some public building within the open space. First it is a high school, then it is a library, or it may be a town hall or even a post office, which is seeking a location. Everybody can see that the proposed building would look well on the town common, while few people stop to think that, after the erection of one or two such buildings, there is no common left. The only way to have both the common and the buildings is to place the buildings somewhere else. The ideal location for good public structures is facing the common — *never upon it*. This rule is positive and admits of no exceptions, unless it be in those very rare instances where a town has too large a common.

2. All other structures should be kept off the common. There are two popular infractions of this rule to which a special word should be given. The first is the erection of a band-stand upon the common. Hundreds of towns have adopted this plan, but in every case the effect is to detract from the openness and dignity of the grounds. In a large majority of cases the band-stand is a shabby and undignified structure in itself, — sometimes an ugly derelict. Another fact, too, should have considerable force, viz., that the typical band-stand is about the poorest possible contrivance from which to deliver a band concert. A stand suitable for band con-

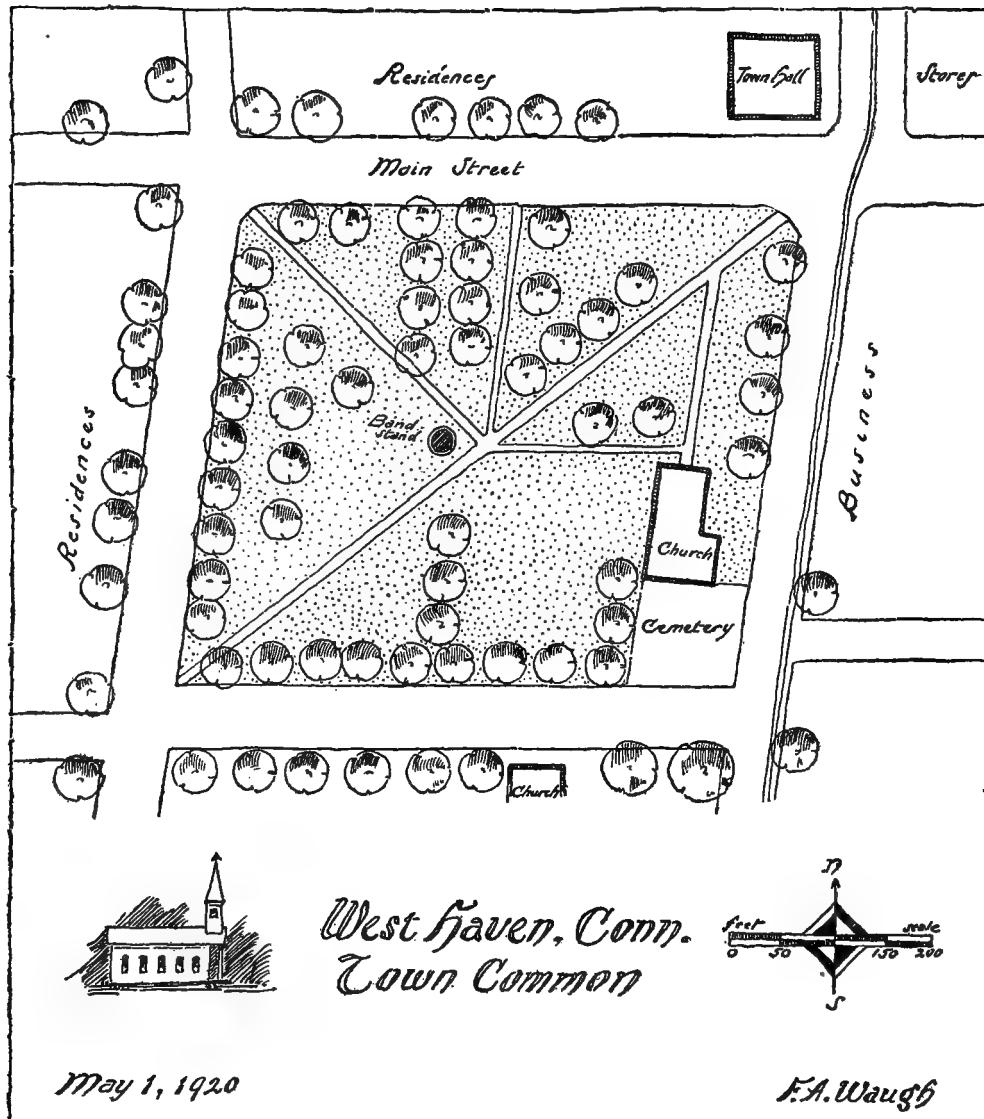


FIG. 94. A LARGE TOWN COMMON OF THE RECTANGULAR TYPE

certs and for public speaking should be quite differently designed; and instead of being located in the center of the common, should be placed on its margin, at one angle, or in some other locality altogether.

The other popular error has been to place the soldiers monument in the center of the common. The fact that our New England soldiers' monuments exhibit, in general, a very low average of artistic taste is somewhat beside the point, though it aggravates the bad effect of misplacement. The effect is so unquestionably bad that the time will come when many of these monuments will be removed to other locations and, let us hope, will be replaced with works better typifying the wholesome sentiments which prompted the present crop of inadequate sculpture. The tendency to use the town common as an appendix to the cemetery and to place commemorative monuments upon it has been somewhat revived in present times as communities are seeking to build war memorials again for the soldiers of the world war. This makes it all the more necessary to emphasize the undesirability of the practice.

3. The proper location for groups of statuary and similar monuments is not in the center of open spaces but in front of or connected with public buildings. Occasionally a large monument may be placed at the end of a street. Some very good sites for large and dignified monuments exist at the exigent angles of triangular town commons where they might face directly down an important road and where they might usually be given a background of trees and shrubbery.

Other structures of a more trivial nature are sometimes placed on the common, but no fair justification of their presence there can possibly be offered. Very simple tablets commemorating important historic events may be a possible exception, though these should usually be located at the outer angles of the common. Attractive guide posts, street lamps, and the customary watering troughs should be placed in the same way.

Necessary Furniture

A special word may be said about seats. On a great many commons seats are in genuine demand. Local circumstances sometimes make it inexpedient to encourage this demand and to supply

seats upon the common, but as a general rule such provision seems desirable. When seats are furnished they should be of good design, very substantially constructed and usually fixed in place. Seats should be located beside walks and not in the center of grass areas.

Walks: Another practical problem arises in providing walks across the common. Many instances are known where ragged, intersecting or meandering walks across a town common cut up the spaces, spoil the grass and seriously injure the whole effect. About all that can be done, however, recognizing the practical necessity of walks, is to reduce them to the smallest number, locate them on direct lines where the travel is certain to go — walk or no walk — and to construct them of good, clean, inconspicuous materials. They can then be kept tidy, at least. Any supposedly ornamental serpentine treatment of the walks on the common is pretty sure to become ridiculous.

Grass and Trees: Careful study of the problem reduces the improvement of the town common to a matter of good lawn and good trees. Clean, open spaces of well-graded, well-mowed and well-kept lawn shaded by large and dignified deciduous trees certainly give the desired effect in ninety cases out of one hundred. Improvement should begin on many commons with a regrading and reseeding of the lawns. Existing lawns on town commons suffer, in many cases, from lack of water and fertilizer. Good feeding and a reasonable water supply are necessary to the development of a lawn anywhere. The practical methods of improving grass lands and lawns need not be taken up here.

The repair of injured trees, the removal of poor or crowded specimens, and the scientific preservation of those remaining should be the next undertaking. In certain places the planting of young trees is to be strongly recommended, especially where, in recent years, gypsy and brown-tail moths, the elm-leaf beetle, leaky gas mains or damaging electric wires have decimated the ranks of earlier plantings.

As a rule, subject to only a few exceptions, the native elm and

the maple are the best trees for use on all town commons. Also it is better to use only one of these species on any given tract, as a mixture of species never gives as clean, unified, and dignified a result. Evergreen trees of any kind should be used very rarely. While plantings should by preference be given a somewhat formal arrangement, they should be restricted mainly to the borders and corners of the area, leaving the center open.

Plantings of shrubbery on commons are usually unfortunate. They catch blowing newspapers and other waste; they are as apt to appear untidy as to enhance the ornamental effect; they may obstruct the view seriously, especially at angles where automobile traffic centers; they are very seldom given the care necessary to keep them in good conditions.

Flower beds of any kind are even less admissible in schemes for improving the common. Only in the most exceptional cases can they be really successful.

New Commons

Practically all of our New England town commons were established years ago for purposes which no longer exist, yet it seems a fair surmise that all these open spaces are more highly prized today than when they were first set aside. It is a fair question then whether a patriotic and far-sighted view would not demand of us that we in this generation make some similar provision for the future. Our towns and villages are thriving. Many of them are growing rapidly. New villages and neighborhood centers are forming. We ought to do for them at least as much as our Indian-harassed forefathers did for us. The opening of new common spaces is a question to be most seriously considered in a number of communities. Very careful preliminary studies will obviously be necessary in any project of this sort.

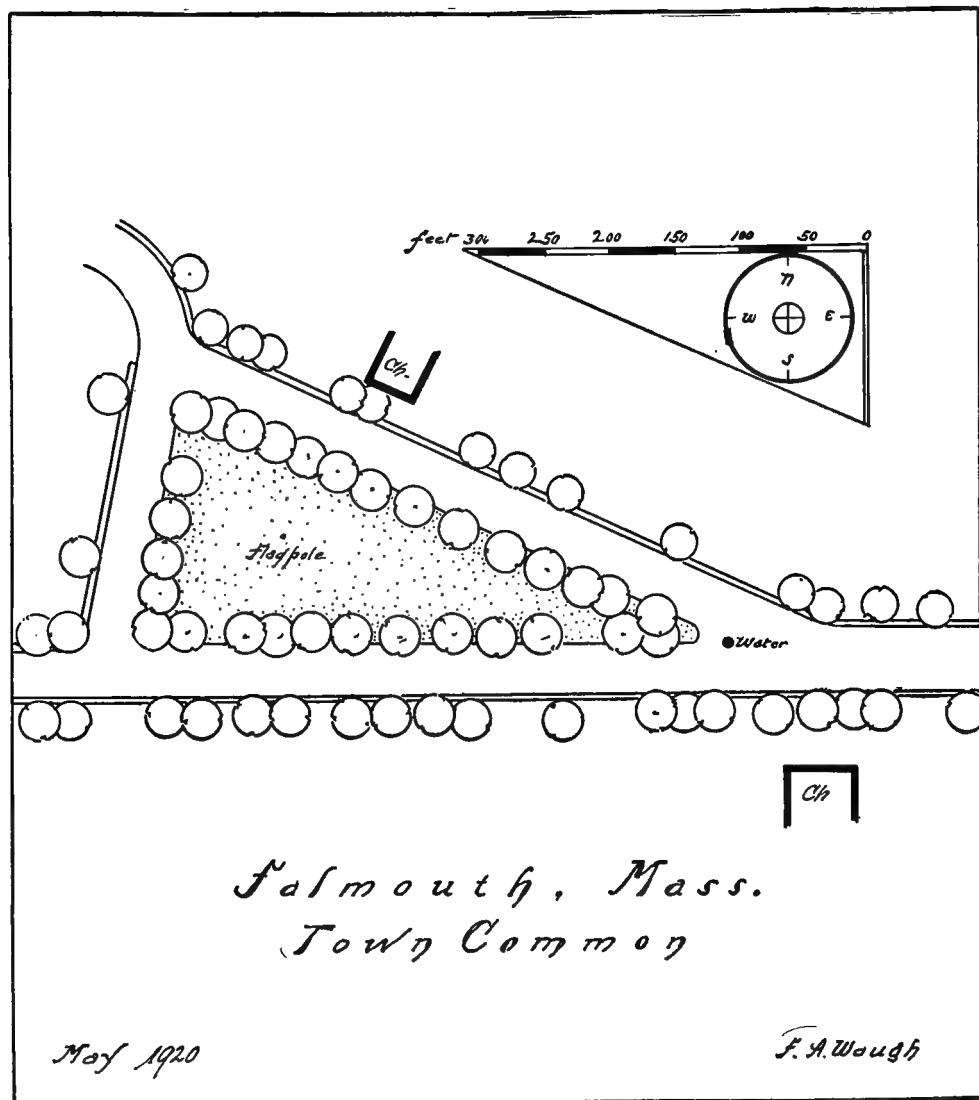


FIG. 95. SMALL TOWN COMMON, TRIANGULAR TYPE

Problems

One or more of the following problems should be worked out by every pupil.

1. Several plans of existing town commons are printed here-with. These may be drawn out to suitable scale and developed in any way the teacher may desire. These are excellent subjects for water-color rendering.
2. If the pupils find themselves in New England or elsewhere where any town commons exist, the most valuable exercise is certainly to make a study of local examples. One or several commons should be surveyed and mapped.
3. In some parts of the country where commons of the New England type are not to be found there are other open spaces of somewhat analogous character in public ownership, and these should be given similar study.
4. On the basis of such surveys and detailed personal examination a new set of plans may be drawn showing possible alterations and improvements.
5. Pupils may also find it an instructive exercise to work out a theoretical design of an ideal town common, either on some known tract of land, or merely on paper.
6. In those cases (mainly outside of New England) where it is necessary to study something not quite the same as a town common very careful thought should be given to the purposes for which the space was set aside, to its present uses and to its best future. These considerations should be reduced to writing and fully verified. They may then form the basis for an intelligent landscape gardening treatment of the area.

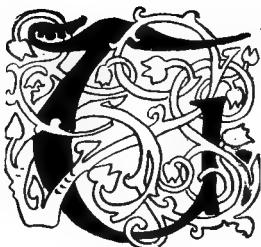
Questions

1. Why did not the New England settlers moving westward across New York, Ohio, Michigan, etc., carry with them the feature of the town common?

2. Why has this feature not been adopted by other American communities, even when the citizens were not of New England origin?
3. Are there similar village commons in European communities?

LESSON 42

SMALL TOWN SQUARE



HIS lesson is intended to give an opportunity for the study of small town parks of the type very commonly found in America, especially in the smaller towns and cities of the middle west. The typical park of this character consists of a square bounded by rectangular streets. Fronting upon this lot may be either business houses or residences, or both. These spaces which are almost universally called parks should be given the less ambitious and more accurate name of squares.

Discussion

During the development of the checker-board towns and cities of the middle west single or double squares were rather frequently set aside as parks. It was sometimes expected that these spaces should be occupied by public buildings. In other instances it was the obvious intention that they should be planted with trees and maintained for the adornment of the city.

Although the purposes to which such land might be put were undoubtedly vague in the minds of the creators, the reservation of such open spaces was exceedingly fortunate. No city could be found where such reservations are now considered too many or too large. On the other hand a great many towns could be found, and more especially larger cities, where more frequent breaks of this sort are now known to be highly desirable.

The first point to be understood, therefore, is that all these spaces should now be kept in public ownership, and should be kept open and free from buildings at whatever cost. A few of these

squares have been made into public playgrounds. While this move is not seriously objectionable, and while the great demand for playgrounds undoubtedly justifies such appropriations of land in many instances, it may be said that playgrounds should be larger and should ideally be located elsewhere, these simple open squares being reserved as breathing and resting spaces. They may also be frequently used for public gatherings, especially for outdoor dramatics, pageantry and music.



FIG. 96. FORSYTH PARK, SAVANNAH—AN EXCELLENT INTERIOR CITY SQUARE

Landscape Treatment

From the standpoint of landscape gardening these city squares present a very puzzling problem. In most cases heavy traffic lines are necessary running diagonally across the squares, and some-

times diametrically. These traffic lines break up the spaces in such a way as to make effective landscape treatment exceedingly difficult. Sometimes a band-stand, pavilion or theater stage may be erected at the center of the square and surrounded by a suitable plaza in such a manner as to make a genuine focus of design and still not interfere with ordinary cross-traffic. In about an equal number of cases it will be found best to place any outdoor theater or similar feature in one of the quadrants between the walks.

In general buildings of all kinds are to be avoided. The larger they are the more objectionable.

These public squares are often chosen as sites for public memorials — monuments and statuary. There seems to be a great deal of doubt as to where these should be placed. It may be said however with confidence that a very large monument may sometimes be effectively placed in the center of such a square, but that smaller monuments should always be placed at the angles or at the entrance of a side street. For instance in the plan shown, Figure 97, a small commemorative monument or statuary group could be effectively placed in the small plaza immediately fronting upon the side street entrance at the west or in the similar place at the east side. In no case should a monument or group of any sort be placed midway along one side of such a square or in the middle of one of the quadrants.

A much too common custom consists in placing upon these squares a great variety of "ornamental" junk, such as pools, fountains, rockeries, etc. All such features should be rigidly excluded. The small city square is no place for any sort of pool or lake unless the whole square is converted into a playground, when a wading pool or swimming pool may have its place.

Plantings of hardy deciduous trees are desirable on nearly all of the open spaces. The primary tree planting should be in straight rows along the street margins and should correspond with the regular street plantings of the vicinity. If an open plaza is designed for the center of the square the next tree planting should be immediately

about this plaza in such a manner as to give it ample shade. It is doubtful whether groupings of trees can be made effective in other parts of the square, and it is usually best to leave the remaining spaces open for grass.

The establishment of good grass lawns is the next step to be considered. The ground of course must be carefully graded in order that such lawns may be kept mowed.

Flower beds should never be used on these spaces unless a very high degree of maintenance can be assured by a well-organized and well-managed park department. Plantings of shrubbery are rarely satisfactory in such localities unless they have the same thorough-going attention.

Suitable seats should be provided under the shade of the larger trees, both along the marginal sidewalks and about the central plaza.

Illustration

Herewith is presented a plan of a typical city square in Minneapolis, Minn. The present design, made by Mr. Theodore Wirth, Superintendent of Parks, is a radical simplification and improvement of a previous elaborate layout.

Problems

The pupil should copy this design at a scale of $1'' = 40'$. The copy may be made in pencil and rendered in crayon, or may be made in ink.

The pupil should now make an exhaustive examination of all the open squares anywhere within his reach. He should make a full record of their size, character of the surface, present use, plantings and furnishings. He should determine whether they are put to the best uses or not and whether additional spaces of this kind can be secured in any way.

The student should next make a detailed survey of some par-

SMALL TOWN SQUARE

ticular public square and on the basis of such survey should prepare a full improvement plan.

The plans of different students in a class, made for the same or

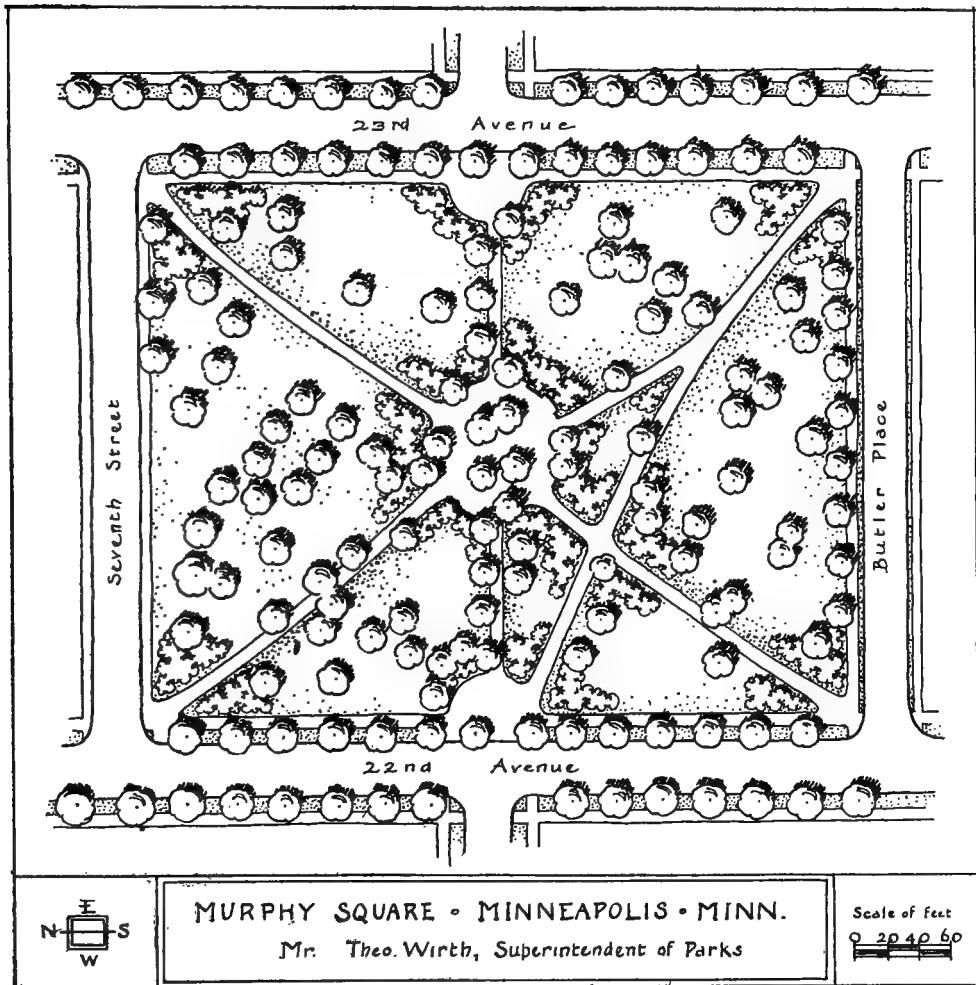


FIG. 97. TREATMENT OF CITY SQUARE IN MINNEAPOLIS

several public squares, preferably all at the same scale, should then be put on joint exhibition. Such an exhibition will give an opportunity for a comparison of the work done by different students;

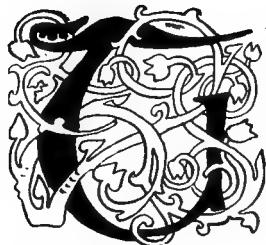
but what is more valuable it will offer an opportunity for general discussion and criticism, an opportunity which should be improved to the utmost.

Readings

C. M. ROBINSON, *Modern Civic Art*, Chap. XV.
O. C. SIMONDS, *Landscape Gardening*, p. 253.

LESSON 43

PLAYGROUND



THE problem here presented for solution is that of the small playground in a crowded city. This involves the preparation of a very compact design in which every inch of ground is used to its utmost capacity. As in all other problems in landscape architecture the student should give first attention to the practical requirements of the problem; secondly he should study the topography and all natural features; thirdly he should provide a solution which meets the practical requirements under the physical conditions existing and with a maximum of good order and beauty.

Illustration

The plan here reproduced is from a design by Olmsted Brothers, landscape architects, for the Hardin Square playground in Chicago, Ill. The plan was executed several years ago.

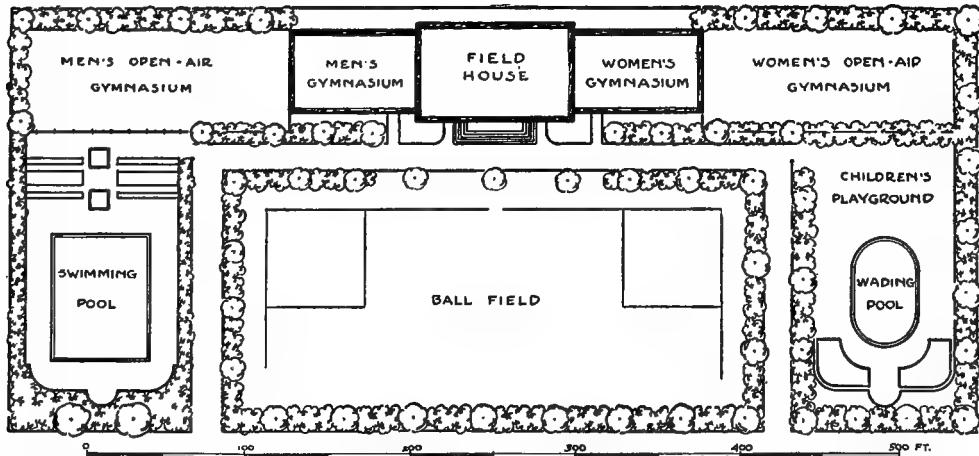


FIG. 98. PLAN OF PLAYGROUND, HARDIN SQUARE, CHICAGO. Design by OLMS TED BROTHERS

Observation

The playground occupies a small rectangular space covering one-half a city block. The land is level and featureless. Taking these facts in connection with the requirement that all space be used to the maximum efficiency, the designer is practically forced to employ a rectangular subdivision of parts and a design made up wholly of straight lines. The design is almost necessarily symmetrical.

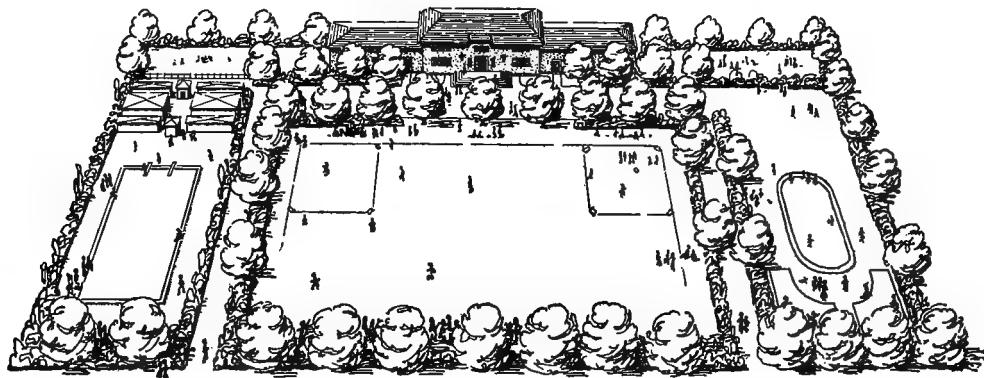


FIG. 99. PERSPECTIVE SKETCH OF PLAYGROUND

In the center is a good sized field-house, used as a neighborhood center, with two wings used as a gymnasium for men and women. Adjoining these gymnasium rooms are outdoor gymnasiums for men and women, each one enclosed. In front of the building is a large play field, used for free play and for baseball or football. In one corner is a swimming pool, in the opposite corner a wading pool and playground for small children. Rows of trees placed on structural lines supply grateful shade and a background of foliage. Between these trees hedge-like borders of shrubbery are developed. The whole plan is exceedingly simple, practical and economical.

Problems

The pupils should visit all playgrounds within reach, make paced surveys and draw out plans showing existing conditions.

PLAYGROUND

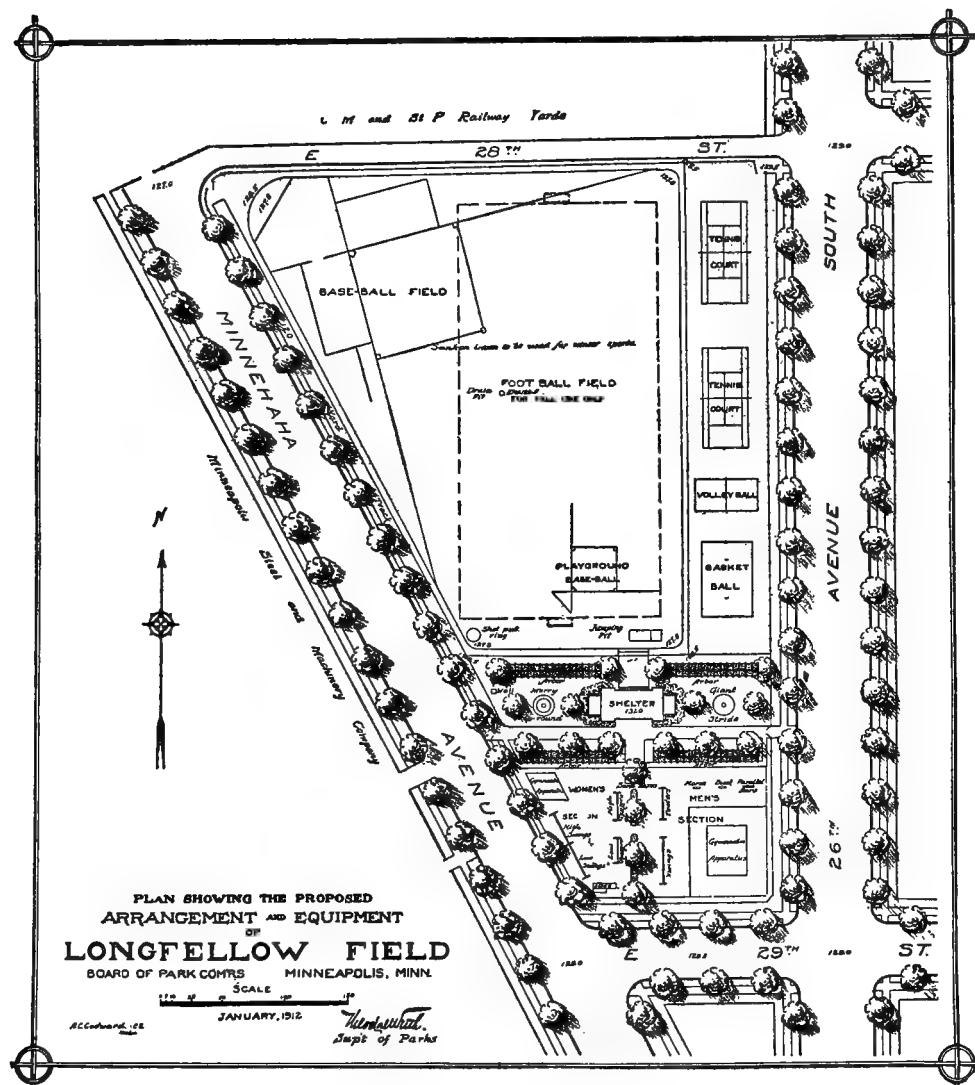


FIG. 100. TYPICAL CITY PLAYFIELD, MINNEAPOLIS

It will be desirable in this as in other problems to copy the design here shown. In the present lesson a new feature of presentation is introduced in the form of a simple perspective. It is desirable for the student to redraw this perspective and to develop

other perspectives of a similar sort from other plans on which he may be at work.

Finally the pupil should himself undertake the design of one or more playgrounds. Preferably these designs should be based upon existing conditions known to the pupil. First a careful survey should be made of the property, a full examination of the requirements, and the design should be worked out in view of these requirements on the basis of the existing conditions as shown in the survey.

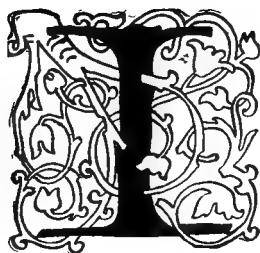
Readings

MERO, American Playgrounds, New York, 1909.

“The Playground,” Monthly Magazine, Cooperstown, N. Y.

LESSON 44

COUNTY FAIR GROUNDS



N this lesson the pupil is asked to consider a somewhat complicated and difficult problem in landscape gardening, that is, the design of a modern county fair grounds. A problem like this belongs naturally to the most thoroughly equipped professional landscape architect, not to the student in an elementary course. It is not expected that the average user of this book will be taught how to manage work of this magnitude, but he can at least reach an intelligent appreciation of the problems involved. If the student gains from this lesson some understanding of the kind of work undertaken by the professional landscape architect, the main purpose of the exercise will have been fulfilled.

Illustration

The example here cited is the plan for the Clay County, Iowa, Fair Grounds. The design is by Mr. Francis Asbury Robinson, of the firm of Pearse, Sprague & Robinson, Des Moines. The layout of this fair can be easily understood from the two drawings, Figures 101 and 102.

Principles of Design

This fair grounds plan has been fully expounded by Mr. Robinson and the following statement of "The Essentials of a Successful Layout" is taken from his article.

"In considering the requirements for success, while too great emphasis cannot be put on the educational elements of a fair, it must be remembered, nevertheless, that if the treasury cannot show

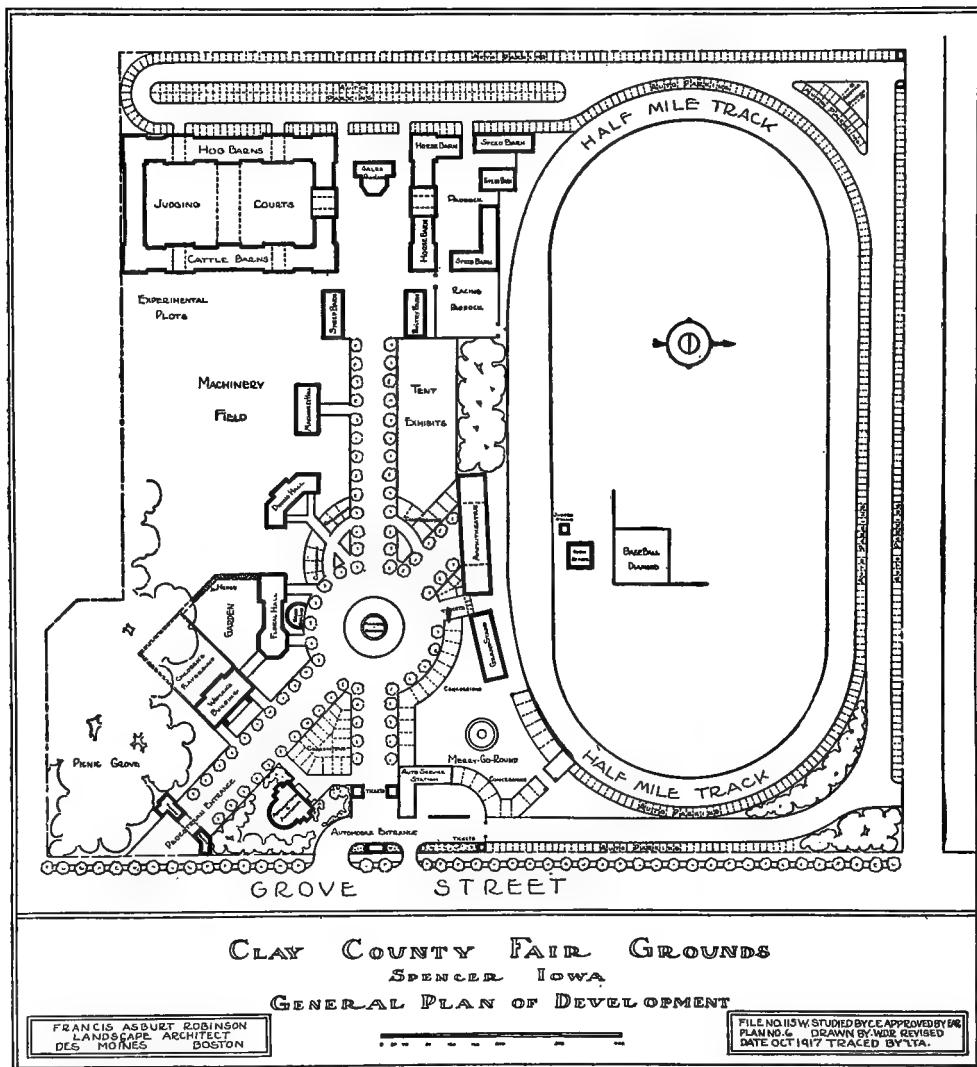


FIG. 101. MODERN COUNTY FAIR GROUNDS IN IOWA

a favorable balance the supporters will not be satisfied. It is strictly a business venture and must show a profit, or at least make expenses, in order to receive the necessary annual support. This consideration means, therefore, provision for additional income over mere gate receipts, or attractions aside from those strictly educational, to

swell these receipts. The race-track, side-shows, concessions for sale of novelties, drinks, and eatables have been the usual recourse and will always be the source of greatest income.

“The task of the designer is to so arrange and coordinate these various features that they will not only present the most attractive appearance and be of easiest access, but also bring the greatest financial return by placing the revenue-producing attractions in the most advantageous positions.

“Consideration must also be given to the varying and diverse interest and needs of both men and women. Live stock, crops, farm buildings and machinery are of greatest interest to the men, while poultry, fruits, vegetables, fancy work and canning make their appeal to the women. It is possible, therefore, to separate the exhibits into two distinct divisions, placing the women’s features nearest and the men’s farthest away from the entrances. A distinct woman’s building should be provided, with rest room and day nursery, and with fenced playground adjacent. In this building provision should be made for the exhibition of laces, fancy work and other objects of particular interest to women. Here, also, light refreshments might be served. In close proximity to this building a floral hall should be located for the display of vegetables and small fruit with which women are intimately concerned. If possible, the poultry and sheep barns should not be far distant, as these contain the stock most interesting of all to women.

“In a central position, easily reached from all the grounds, a dining-hall should be erected. This may be made one of the most profitable buildings on the grounds if properly managed. The centralization of eating facilities is important and always proves one of the most successful features.

“For the proper facilitation of the business of the fair an administration building is an important unit. This should be near the main entrance and the direct line of traffic, so that it may be easily reached by all visitors with a minimum of confusion. This building

may be of quite permanent construction, so that winter meetings may be held here in connection with auctions or sales.

"The main feature of the stock barns should be a judging pavilion for all-year display and sale of stock. Here may be kept the permanent books of the various stock associations, together with

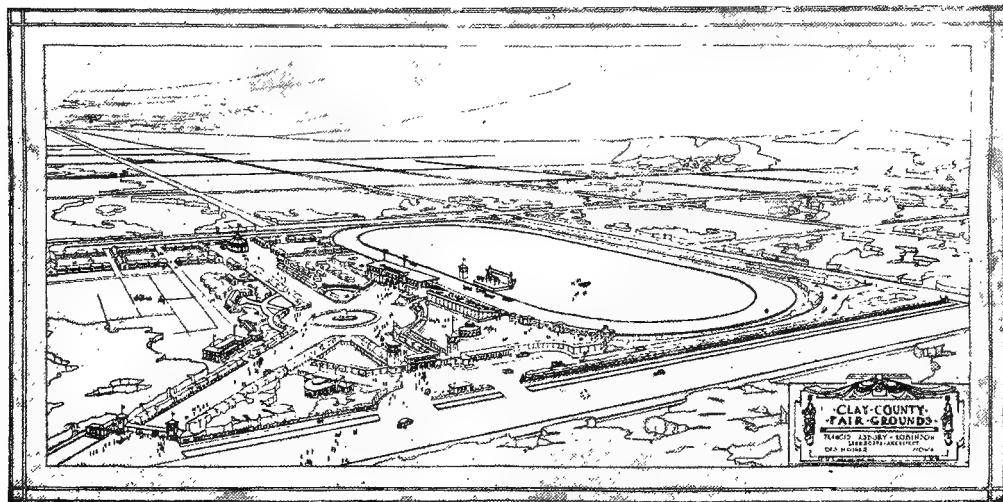


FIG. 102. AEROPLANE VIEW, CLAY COUNTY FAIR GROUNDS

auction and sales records. This building should be centrally located in relation to the barns, as they are all subsidiary to it, and the entire group should be placed at a point quite remote from the main entrances, because of unpleasant odors and on account of the desire of interested visitors to get away from the crowd when viewing stock.

"If possible, the machinery hall should be located in a position between the women's building and the stock barns, for the exhibits here are interesting to both sexes — from electric washing machines to automatic milkers. In the rear of or near the machinery building there should be an open field for the display of large farm machinery, harvesters, binders, elevators, tractors and the like, where there is ample room for demonstration purposes.

“The principal consideration in the location of the amusement sections is that they be permanent and so distributed that the maximum number of people will have to pass each attraction with minimum congestion. The amphitheater and race track should if possible be on one of the main avenues leading from the entrance, so that the great crowds may readily find them. For orientation, north is preferable and east permissible, in order that the sun may not shine in the spectators’ eyes, and the long axis of the track should be east-and-west, so that the finish may be toward the east and avoid the blinding sun in the afternoon, when the majority of races are held. The size of the track depends much on the desires of the community, but the tendency in modern construction is towards the one-mile track, which can be utilized for horse-racing as well as automobiles. This gives a distinction over the old type, although the half-mile track is more easily seen by the crowd and requires greater skill in driving, owing to the increased number of turns. Much opposition has been made by turfmen to the use of the track for automobile races, but experience is proving that it requires not a great deal of maintenance to have a dual-purpose track, and the revenue is of course much greater.

“In designing the ground plan of a fair the traffic problem becomes the major consideration, after building provision, owing to the ever-increasing number of automobiles. In fact, autos are the making of county fairs. For ease of handling and as a safety precaution, complete separation of vehicular and pedestrian traffic is strongly urged. Separate entrances on different sides of the grounds should be provided, if possible, and individual parking booths should be created to care for every machine. The exits should be apart from the entrances, so that a one-way traffic ruling may be enforced. Only thus can congestion be avoided during all times in the day.

“While congestion should be avoided on the main thoroughfares for pedestrian traffic, still there is a point in keeping the crowd from scattering over so large a territory that the effect of size is lost. Nothing is better advertising than crowded grounds. Too

much emphasis cannot be laid on this feature of the design. To properly arrange thoroughfares to take advantage of this psychological effect and still permit easy and free movement is the designer's problem."

Study

Pupils should first give careful study to the foregoing "principles of design" as enunciated by Mr. Robinson, and should examine the plan of the Clay County Fair Grounds in detail to see how each of these principles has been worked out. The class should then go over the plan together, taking up each item, as location of race-track, location of live-stock arena, provision for concessions, dealing with automobiles, etc., discussing and criticizing all these points.

If the class can now visit a fair grounds they should attend in a body accompanied by the teacher; and though a visit while the fair is in session would be illuminating and much worth while, the final examination for study should be made when the grounds are not in actual use. At this time the layout should be studied in the manner already recommended, item by item, and all points criticized in the light of the principles of landscape architecture thus far developed. Such questions as the following should be asked and answered:

Are the grounds favorably located?

Is the land topographically suited to its uses?

Are the grounds large enough?

Are the grounds clearly and properly subdivided and apportioned for the desired uses?

Is the entrance in the right place?

Is the entrance area well designed?

Are the buildings properly designed and well suited to their several uses?

Are the buildings most advantageously placed? Are they grouped effectively?

COUNTY FAIR GROUNDS

Is the provision for traffic circulation, both pedestrian and vehicular, the best that could be desired? Are the two classes of traffic separated?

Are the race-track and amphitheater well placed and equipped?
Are the concessions properly cared for?

Other similar questions will certainly arise during such a study, and should be answered.

In case the class cannot visit any fair grounds in a body for this exercise, it may be possible for them to study the plan of some familiar grounds and to answer most of these questions from the plan.

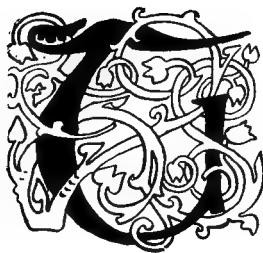
Finally each member of the class should reach the conclusion that the design of so complicated an organism as a fair grounds can be much better drawn by a trained landscape architect than by a county fair committee consisting of one retired farmer, one real estate promoter and one automobile dealer.

Reference

The pupil may find it desirable to consult the entire article by Mr. Robinson, parts of which are quoted in this lesson. This article on "Modern County Fair Grounds" appears in American City, 18 : 409, New York, May, 1918.

LESSON 45

CIVIC CENTER



THE purposes of this lesson are to develop the significance of the civic center in city and country planning, to place two or three simple examples before the student's attention, and to make a study of civic centers in the pupil's home neighborhood.

Definition

A civic center is a group of public buildings placed conveniently near together, with the grounds surrounding them.

These buildings may be few or many, large or small, simple or grandiose in the extreme. There may be included in the group also certain quasi-public buildings, such as churches, parochial schools, telephone exchange, hotel, etc. Any buildings largely used by the public may be grouped for the purpose of gaining certain manifest advantages.

There may be civic centers of different kinds. For example the city hall, post office, customs house and court-house would form an administrative center; the city library, high school and concert hall would constitute an educational center; a union railway station, interurban trolley station and steamboat wharf grouped together would make up a traffic center.

Discussion

The advantages sought in such groupings of public buildings are both practical and esthetic. On the practical side it seems obvious that the public business can be transacted most efficiently if the

CIVIC CENTER



FIG. 103. TWO SIDES OF SAN FRANCISCO'S IMPOSING CIVIC CENTER

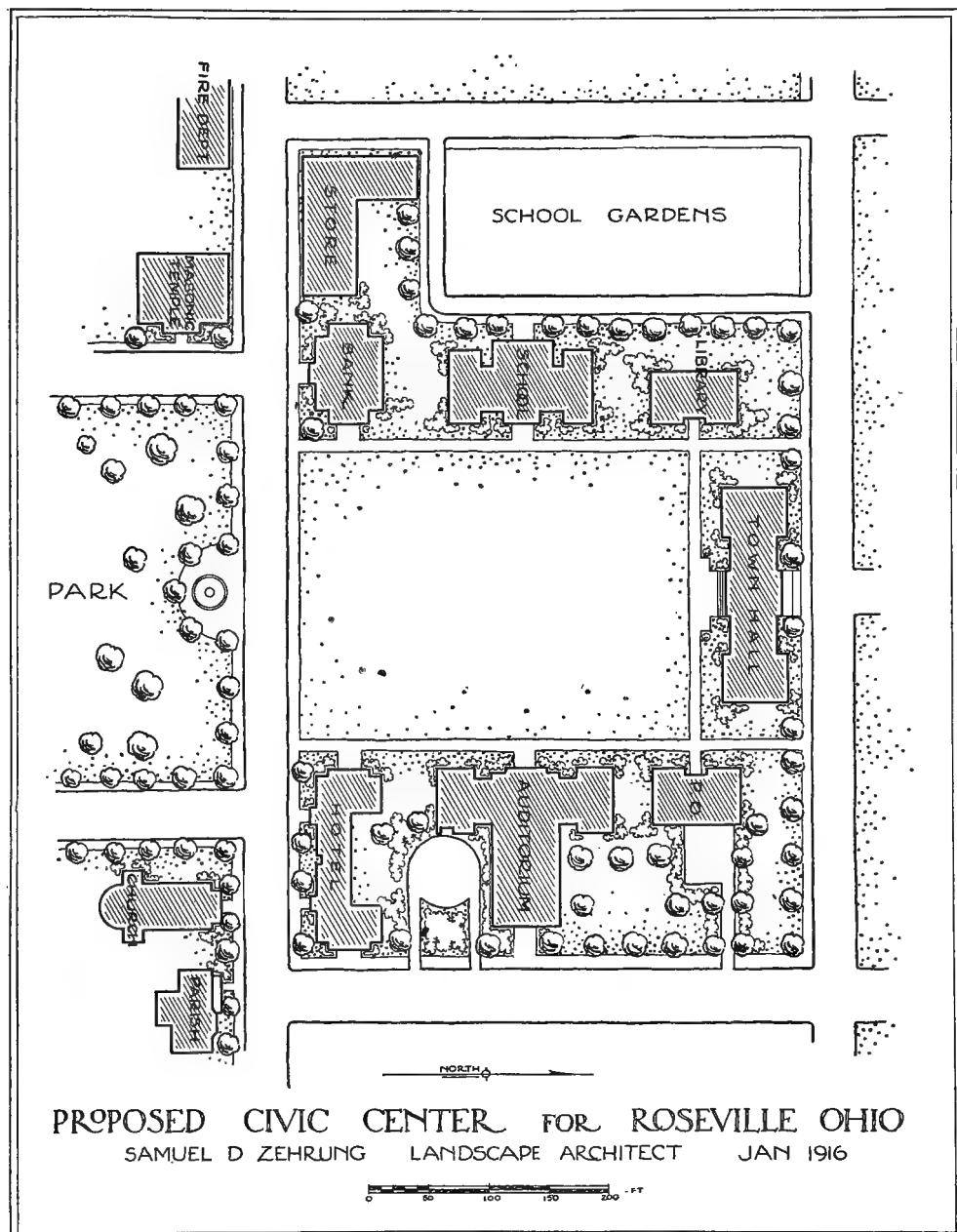


FIG. 104. DESIGN FOR A CIVIC CENTER

CIVIC CENTER

various offices are located near each other. The Eastman Kodak Co. would hardly care to have their large plant scattered all over Rochester, nor would Mr. Henry Ford make his low-priced cars so economically with his factory divided into six or eight units and distributed to the four quarters of Detroit. In exactly the same way the public business of a town or city should be concentrated into the smallest practicable space.

The esthetic advantages of bringing together the various public buildings of a town or city are even greater. If a city's public buildings are well and harmoniously designed and if they are properly grouped and if they are given suitable open space the total effect is greatly enhanced. A city with such a civic center has something to be proud of, something to incite civic patriotism, something to arouse and symbolize a love for "the home town."

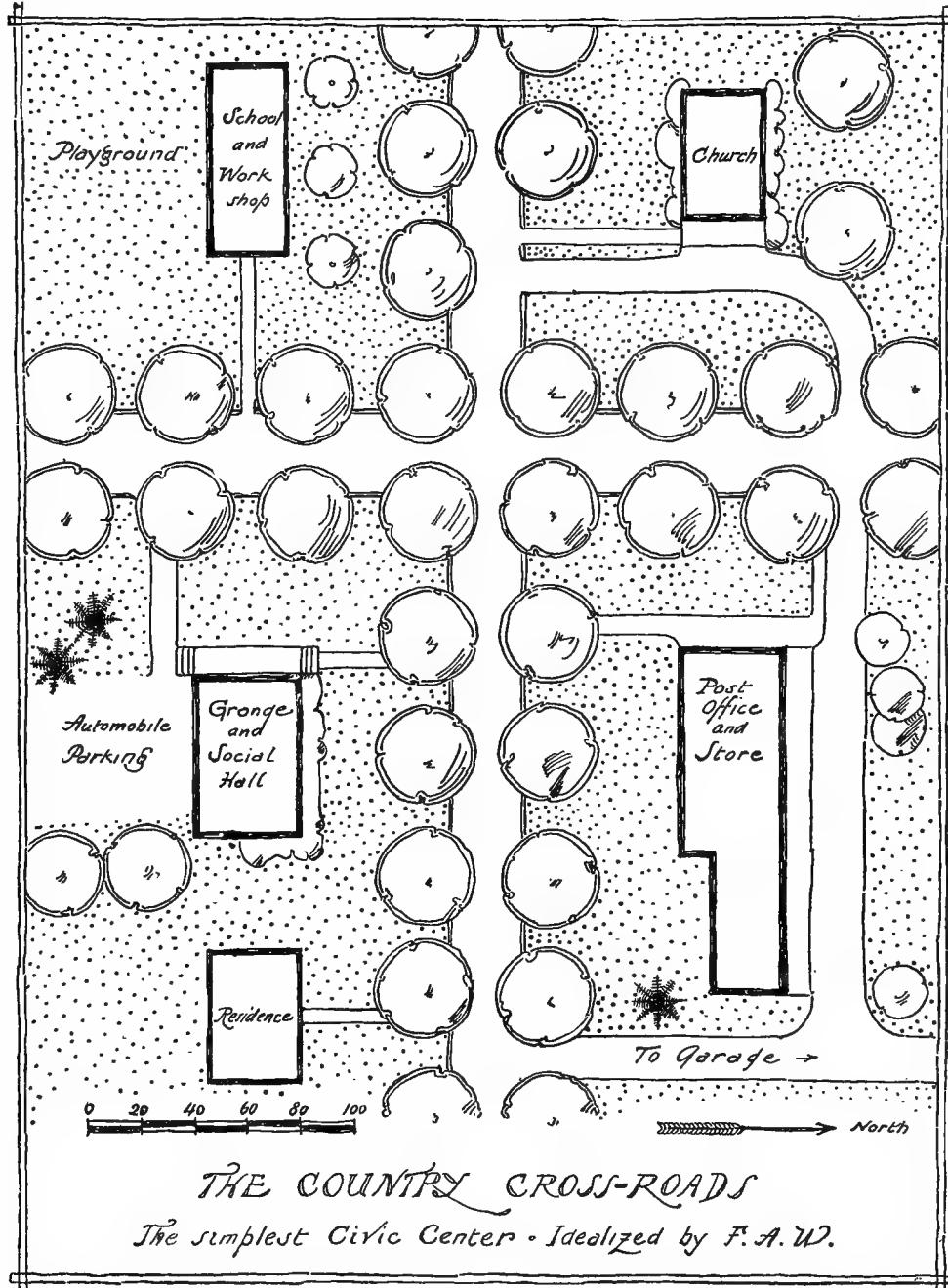
Many American cities are making earnest effort for the development of good civic centers. At this moment we may perhaps give first place to San Francisco, Calif., but promising beginnings can be found in a thousand different municipalities.

It must be understood, of course, that the smallest villages and country districts may, should and do have their civic centers just as truly as the great world capitals. Thus a post office, church, school and social hall brought together at the country cross-roads has the same civic significance as the great masses of big buildings along the mall in Washington, D. C.

Illustrations

Two illustrations of civic centers are included in this lesson. The first is a study based upon existing conditions in Roseville, O., made by Mr. Samuel D. Zehrung, landscape architect. The second is an idealized grouping of public buildings at a country cross-roads.

In connection with this lesson the pupil should also consult the plan of the court-house square shown on page 180 and the plan of



THE COUNTRY CROSS-ROADS

The simplest Civic Center - Idealized by F. A. W.

FIG. 105. A RURAL CIVIC CENTER

CIVIC CENTER

the village center page 97, both of which represent partially developed civic centers.

Problems

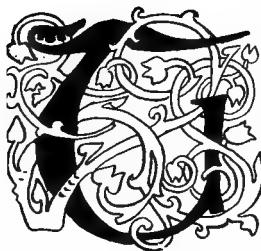
The pupil should first copy these two drawings at a scale of $1'' = 30'$. These copies should be made in ink, or in pencil and colored crayon.

The next step should be to discover and map any civic centers in the vicinity. To this problem the pupil should give special attention.

Revisions of existing layouts may then be undertaken. Problems of this kind are of course very difficult, especially if one regards the practical obstacles to their realization. The beginner in the study of landscape architecture should not expect to solve immediately the most serious physical problems of Chicago, New Orleans or Atlanta, or even of Hickville or Podunk, but he can, profitably to himself, put a lot of study into such problems, especially if he will confine himself to small-town conditions. A good teacher can, of course, give many useful suggestions at this point.

LESSON 46

COUNTRY SCHOOL GROUNDS



HE country schools of the nation are highly important and the physical surrounds of each school play a highly influential part in determining final results. It is desired at this time to learn what present conditions actually are, what ideal conditions would be, and how the former can be made to approach more nearly to the latter.

Specifically this lesson considers the plan of the country school grounds.

Argument

Size of Grounds: Some school grounds are too small. Exuberant school boys and girls cannot be confined like convicts in a penitentiary. The country boy who does not necessarily cover more than half an acre in his first ten minutes of play should be sent to the hospital at once. There is something wrong with him. In the country, where land is cheap and where people are unused to being crowded, the school grounds should be ample. One acre may be regarded as the minimum for any school; two acres is not too much for a large and well-managed country school; while high schools and academies, especially those teaching agriculture, will sometimes need five or ten acres. Country schools which now have less than one acre should buy more at the first opportunity.

The School Building: The school house, which of course should be well built, well furnished, well lighted, well ventilated, well painted, and well kept, should be placed well forward on the lot, near the street. This is because land back of the school house is valuable, while that in front is comparatively useless. A distance

of twenty to thirty feet back from the road is usually satisfactory. Where practicable one good shade tree, — maple, oak, or elm, — should be placed twelve to twenty feet to the south of the school house, and another similar tree the same distance to the southwest.



FIG. 106. A CLEAN AND ORDERLY SCHOOL GROUNDS

The shadows of these trees falling on the building, will do more than any other one thing to relieve that appearance of forlorn nakedness and utter crudity so depressing in the average school house. Wherever conditions permit much can be gained also by having a narrow border — three to six feet wide — of shrubbery along the house foundations. Usually these borders should be of native species collected from adjoining fields by school pupils.

Other Buildings: As a rule the disgusting limit is reached in the insanitary outbuildings of the country school grounds. The disgrace of this condition is so commonly felt that no argument against it need now be made. The sanitaries should be placed at the back line of the lot, in which case they should either be separated by a fence or should be at the outside corners with the width of the lot between them. They should be screened from view by plantings of native shrubbery. In certain cases it is better to group the sani-

taries at the back of the school house, connecting them with the woodshed or some similar structure. Very special effort should be put forth to keep them clean and in repair.

Fences may be dispensed with on a good many rural school grounds, and should never be built unless clearly needed. Where

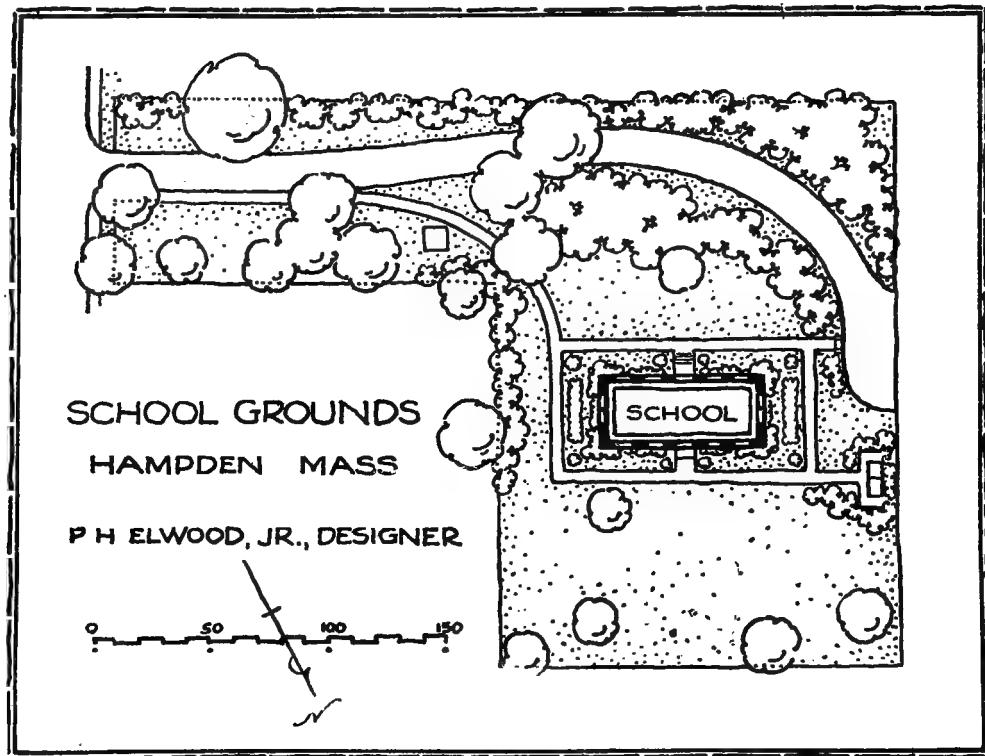


FIG. 107. IMPROVEMENT PLAN FOR RURAL SCHOOL

they are positively required they are usually best made of heavy woven wire, boy-high, boy-strong, and boy-tight, to paraphrase a famous saying. Every fence should have enough annual attention to keep it whole and standing straight.

On a few country school grounds horse sheds will be needed. These should be at the back of the lot, out of the way of the play, but open to constant public view.

COUNTRY SCHOOL GROUNDS

Play Grounds: School children need abundant room for play. One might suppose this was sufficiently obvious to be generally known, but the niggardly provision of land, even in the country, indicates that the fact has been widely overlooked. Apparently it has been tacitly assumed in very many instances that the school pupil will play in a neighbor's pasture or in the public road, where, between the bulls and the automobiles he might really get considerable exercise. Yet neither private pasture nor public road is to be seriously accepted as a proper provision for valuable boys and girls.

A baseball diamond is the first necessity for a playground. A full-size diamond, ninety feet between bases, requires about three-fourths of an acre in itself. A small boy's diamond, sixty feet between bases, requires half an acre, or more than the entire allowance for some school grounds. Other sorts of play should also be provided for, such as swings, slides, etc., with adequate open grounds for the usual children's games.

The planning and equipment of playgrounds and the organization of proper play is a whole subject in itself. In many communities this matter ought to be taken up urgently and quite aside from the question of school grounds.

School Gardens: Every country school ought to be provided with some sort of school garden. Just what use will be made of it depends largely on the teacher. Even the poorest teacher can do something with it, while in the hands of a really good manager the school garden will become the most useful feature of the school equipment.

The school garden should be small. A large parcel of land is apt to grow up to weeds. One quarter of an acre will be ample for most schools; and a quarter of that will be a great deal better than nothing. This garden, however, should be an integral part of the school plan. It should lie next to the playgrounds, and should form an attractive feature in the general effect.

Trees and Shrubs: On Arbor Day it is customary for the girls to speak pieces and the boys to plant trees. Inasmuch as the av-

verage school yard has room for only three or four trees, this exercise has to be given up or the yard is soon over-crowded. Plantings of shrubs about the foundations of the school house, along the property bounds and in front of out-buildings may well supplement or take the place of tree plantings. Such shrubs should preferably be of native species collected from the fields by the students. The best plan is to grow them a year in the school garden nursery before

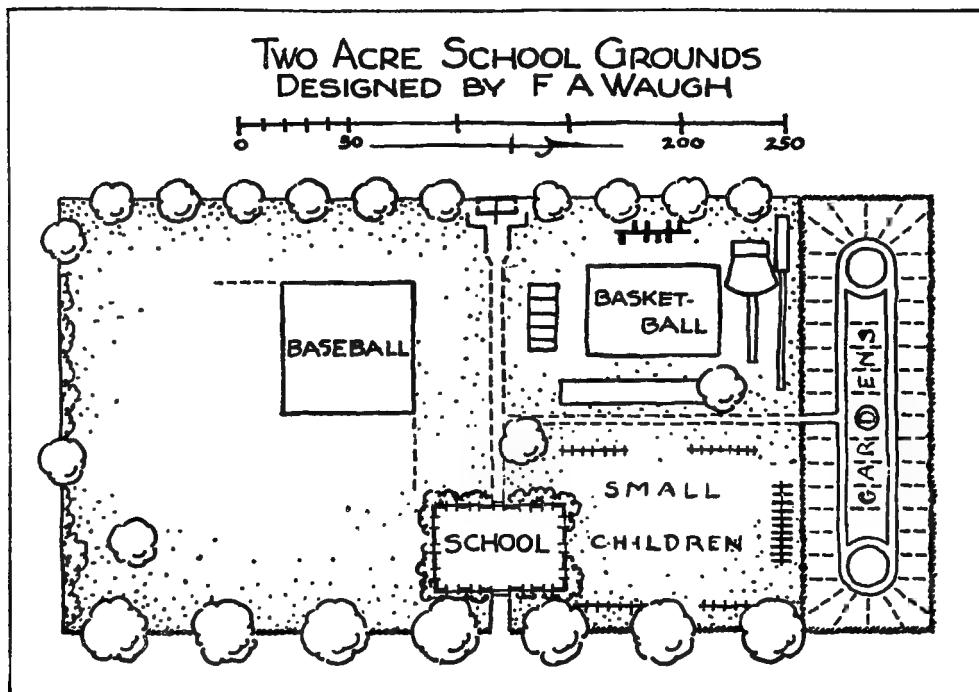


FIG. 108. COUNTRY SCHOOL GROUNDS WITH PLAY GROUNDS AND GARDENS

transplanting to permanent situations. More elaborate schemes of so-called ornamental planting on school grounds are to be viewed with suspicion. Flower beds in the front lawn rarely yield anything more than disappointment, and not much of that.

Ground Plans

The most important points to be observed in school ground design are:

1. *Convenience*: The practical requirements must be met first and absolutely. They are very definite and cannot be ignored.
2. *Simplicity*: The simplest scheme of layout is almost necessarily the best.
3. *Orderliness*: A hit-or-miss, jumbled-up arrangement of parts is fatal to good design.

The "beautification" of school grounds, sometimes soberly discussed, must be achieved through convenience, simplicity, and good order. A failure in these qualities can never be covered up by any quantity of "ornamental planting."

General Care

Maintenance is even more important than the original layout of school grounds. The grounds must be kept clean and in good order at all times. The school house and out-buildings must be clean and in repair. All this costs more in thought and labor than people commonly suppose. It is in fact much more expensive in both time and money than any scheme of beautification likely to be undertaken. Moreover, it requires much larger moral qualities to pursue the daily drudgery of maintenance and to keep everything always looking spick and span. It is a good thing for the school teacher, the school board, or the village improvement society to organize a campaign for the improvement of school grounds. It is an equally good thing to conduct a campaign for their daily care.

Problems

Problem I: Each pupil should now be required to report, preferably in writing, upon one or more rural school grounds, such reports, of course, to be based upon actual visits and careful ex-

amination of the grounds discussed. These reports may be outlined upon the points covered in the preceding argument, and should supply direct and unequivocal answers to the following questions:

1. How large are the grounds? Are they large enough? How much more land is needed, if any? What is it needed for? Where can it be added? What will it cost?

2. Is the school house satisfactory? If not, what are its defects — Size? Appearance? Paint? Orientation? Set-back?

3. Are there other buildings or fences? Are they satisfactory? What more is needed?

4. Are the playgrounds adequate? What more is needed? Is play apparatus desirable?

5. Are there school gardens? Are any needed? How can they be provided?

6. Are there trees and shrubs? Are others needed? If so, what and where?

7. Are the grounds well planned for efficiency and beauty? What changes could be made?

8. Are the grounds properly cared for?

9. Be sure to report the size of the building, the number of rooms, the number of teachers and the number of grades accommodated.

These reports should, of course, all be read and criticized by the teacher; but as far as time permits they should be read in class and freely discussed by all pupils.

Problem II: Make a paced survey and plan of an existing country school ground, and on this survey prepare a plan for the ideal reorganization of the grounds. This exercise will work out favorably if all pupils in a class are assigned to the redesigning of the same grounds. The various solutions handed in by the several pupils should then be displayed together and criticized by the teacher and pupils together.

Problem III: As this subject is one of great popular interest and social importance it may be worth while to extend the study by

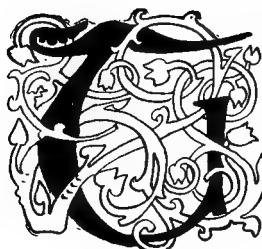
taking up a third problem. For this purpose it will be well for each pupil to design an ideal rural school ground. Definite conditions should be assumed, for example, a one-room school in a stock farming district attended by 35 pupils and covering grades 1 to 6. The ideal plan should be attractively drawn to scale, possibly rendered in water color; and all the plans of all members of the class should be displayed together for discussion and criticism.

Readings

CHALLMAN, S. A., *The Rural School Plant, Milwaukee*, 1917.
SIMONDS, *Landscape Gardening*, Chap. XV., *New York*, 1920.

LESSON 47

CEMETERY IMPROVEMENT



HERE are two leading purposes in this exercise. The first is to study the common problem of the improvement of an old cemetery; the second is to illustrate that form of professional landscape gardening which uses the written report in the presentation of working plans.

Regarding the first of these purposes it may be said that nearly all public cemeteries stand in need of improvement, that this need is obvious and generally recognized and that all cemeteries have pretty much the same problems.

Regarding the second purpose we should observe that a considerable part of the practice of the professional landscape gardener consists in giving advice, which should always be written, and which nearly always can best be presented in a formal report. While the writing of reports is primarily an exercise in language there are certain formalities which should always be observed. In general the requirements of a good professional report are (1) sound advice — the recommendations made must be technically correct, (2) form — the materials should be arranged in logical order (3) language — terse, simple, clear language should be used.

Materials

There is given below a transcript of a report made upon an ancient cemetery in Provincetown, Mass. This should be studied, both as to form and matter. The principles discussed in this lesson should finally be applied to some cemetery which can be visited and reported upon by the pupil.



FIG. 109. CHAPEL AND PLANTINGS — GRACELAND CEMETERY, CHICAGO.
O. C. SIMONDS, Designer

Herewith follows the report mentioned above:

AMHERST, MASS., Sept. 30, 1914.

THE RESEARCH CLUB,
MISS FRANCES C. GIFFORD, SEC'Y,
PROVINCETOWN, MASS.

On September 26 I visited Provincetown and in company with several members of your club examined the Old Cemetery. At that time I gave you some verbal suggestions as to methods for the improvement of this tract and promised to send you further this written statement of my advice.

I found that the Old Cemetery is a field of 4 or 5 acres, quite irregular in outline and conspicuously rough in topography. The soil is mostly dry, loose, fine sea sand. This soil is bare except for an irregular growth of beach grass, some patches of huckleberries, wild roses, beach plums and similar low shrubbery, and a few picturesque old junipers near the center.

The difficulties of establishing any sort of ornamental growth on this land are extreme. The chief of these, briefly stated, are the sterility of the soil, the lack of water, and the exposure to the severe sea winds.

The first and most important thing to be done, in my judgment, is to establish a strong, heavy wind-break about the cemetery, especially on the windward boundaries. This wind-break should accomplish two purposes, the first one practical, the second esthetic, but both of prime importance.



FIG. 110. THE NEGLECTED CEMETERY

Practically it will be necessary to break the sweep of the sea winds across the cemetery before any other ornamental plantings can be established. Esthetically the privacy to be secured by an enclosure of green trees is invaluable. At present the grounds are notably bleak, uncomfortable, dreary. Shut in by a wall of green they would be comparatively cozy, quiet and restful. Such a spot would offer upon these wind-tortured hills the spirit of refuge which is the appropriate spirit for the Old Cemetery.

This wind-break should be constructed of any trees which can be effectively grown, species being chosen with reference to their vigor and hardiness under the very adverse conditions rather than to their looks or popularity. Such trees are the Silver Poplar, the Black Locust, Willows, Ailanthus.

These should be planted in a thick border from 10 to 30 feet wide. They should not be pruned up to clean trunks, the object being to make the border impervious to the wind. Along the margins of this tree border may

CEMETERY IMPROVEMENT

be planted thick-growing shrubs such as Sumachs, Beach plums, Bay berries and Viburnum dentatum.

After this wind-break has become established, that is after a period of 10 to 20 years, its composition may be substantially improved by the gradual substitution of better species. Such kinds as European linden, some pines, possibly spruces, Red Oak, Carolina Poplar, Lombardy Poplar, Elms, Norway Maple, which could not be grown on the open hills, may be brought in under the protection of the harder Silver Poplars, Willows and Locusts.

The second fundamental requirement for the Old Cemetery is some effective ground cover. It will never do to leave the dry sand exposed. At the outset this ground cover must be composed of any species whatever which will condescend to grow here. The best of these are the Huckleberry, the Bay berry, the Beach Plum and the wild Roses; but any others which volunteer their services must not be despised. Even the unpleasant Beach grass should be retained until something else will take its place.

Some sort of ground cover once established, its composition can be gradually improved, as in the case of the bordering wind-break, by the substitution of better species for the coarser and less agreeable. But some



FIG. 111. AN ANCIENT CHURCH-YARD CEMETERY

TEXTBOOK OF LANDSCAPE GARDENING

permanent cover of living material is absolutely essential to any further progress.

The suggestion made by one of your members to use the wild cranberry ("bog cranberry") upon the open spaces strikes me as very promising. Probably experiment would discover practicable means of transplanting and establishing this species in quantities.

In this connection it seems best to advise you regarding two methods of great importance in handling all kinds of trees and shrubs, especially under your very difficult conditions. The first of these relates to the preparation of the soil, the second to the development of plants which will live when transplanted.

In general you will find it advantageous to dig the soil up quite thoroughly before planting. It is good practice to do this digging in the fall where trees or shrubs are to be planted in the spring. If a dressing of barn-yard manure, or of sea-weed, fish waste or similar material can be put on in the fall this will be an additional and important advantage.

After trees and shrubs are planted, especially during the first year, it is quite important that they be cultivated several times with a heavy hoe. This will keep the soil in good condition, will keep down weeds, and will greatly assist the young plants through their most critical period.

All trees and shrubs can be transplanted much more successfully from cultivated soil than from the open fields where they are growing wild. This difference becomes vital when conditions are as contrary as upon the soil of the Old Cemetery. I would urgently recommend therefore that you establish a small nursery upon some piece of good garden land which you may be able to secure for a time, and that you stock this nursery with small plants of such trees and shrubs as you are likely to require. These small plants may be secured from the fields and should be taken in large quantities in order to allow for a considerable percentage of loss. In the nursery they should be kept hoed and cultivated, but need not be irrigated. After one or two years in the nursery they may be transplanted to their permanent positions with comparative certainty of their growing.

The incidental suggestions with respect to walks, steps, etc., made during our mutual discussion hardly need to be reported here.

If I can be of any further service to you in any connection, I trust you will command me.

I am

Very respectfully yours,

FRANK A. WAUGH,

Landscape Gardener.

Form of Report

Any written report of this kind should take a definite form, substantially as follows:

1. *Address:* It should be addressed to some person, committee, corporation or society responsible for the work. This is the party spoken of by the landscape gardener as his client.
2. *Statement of problem:* The report should begin with a very brief statement of the problem, telling where the property is and adding any essential facts.
3. *Existing conditions:* Next should follow a statement of existing conditions, especially such as have a material bearing on the problem.
4. *Solution:* Now follows the main statement of recommendations, with any argument which may be necessary to its support.
5. *Details:* Next the various details should be taken up, especially practical directions for carrying out the work.
6. *Estimates:* The probable cost of carrying out the recommended improvements should be estimated as closely as possible.

Cemetery Improvement

Nearly all old cemeteries present the same defects. The following points must usually be considered:

1. *Clean up:* The place must be cleaned up and put in order, fences repaired, monuments straightened up, roads put in order, etc.
2. *Regrade:* Very often the lawns need grading.
3. *Reseed:* The lawns nearly always need reseeding, removal of weeds, or other attention to the grass.
4. *Plant Trees:* Occasionally one finds a cemetery which is overplanted with trees. The more common case is a lack of trees, especially good ones. It may be doubted whether the common tendency toward a predominant growth of evergreens is altogether appropriate. Certainly the best landscape cemeteries in America

are characterized rather by their growth of large deciduous species, such as oaks, maples and elms.

5. *Plant Shrubbery*: A certain amount of good hardy shrubbery adds greatly to the landscape charm of any planting. Such treatment is suitable to most cemeteries.

6. The development of broad landscape features, such as ponds, running water, woodland masses or open meadows, wherever possible, will nearly always be desirable.

7. Restriction and regulation of monuments is an essential feature of the management in many of the best cemeteries, but is not practicable everywhere.

8. Perpetual care is often provided through invested trust funds. Such endowments are always desirable where they can be established under stable management.

Assignment

After this study each pupil should be required to examine some cemetery and write a report. These reports should be examined, compared and criticized to the fullest extent possible under limitations of time.

Readings

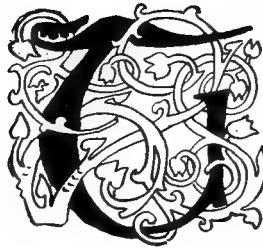
WEED, *Modern Park Cemeteries, Chicago*, 1912.

SIMONDS, *Landscape Cemeteries*, in *Bailey Standard Cyclopedia of Horticulture*, Vol. IV, p. 1807, *New York*, 1916.

SIMONDS, *Landscape Gardening*, Chap. XVII, *New York*, 1920.

LESSON 48

COUNTRY ROAD SYSTEMS



HIS lesson is intended to raise certain questions with regard to the layout of country road systems. It is hardly possible in the short space of an elementary chapter to answer these questions. Indeed we may doubt whether they have ever been finally answered. It certainly is dangerous to dogmatize regarding these matters.

Illustrations

Figure 113 shows the road system in a small section of Franklin County, Mass., where the land is very hilly, almost mountainous.

Figure 112 shows a similar area in Barnes and Cass Counties, North Dakota. It will be seen at once that this second plan covers an area in which the roads are laid on section lines of the original government survey. In the other illustration the road system grew up under use.

Discussion

The general road plan however is a matter of the greatest importance to everyone who lives in the country, and even to those who live in the city and drive through the country. Where such radical differences exist as those shown between these two plans the question very naturally arises whether one system is better than the other. Careful students of the subject generally consider that the lattice-work system provided by the government survey and shown in Figure 112 is defective and less satisfactory than the natural web of roads which grows up in response to definite local

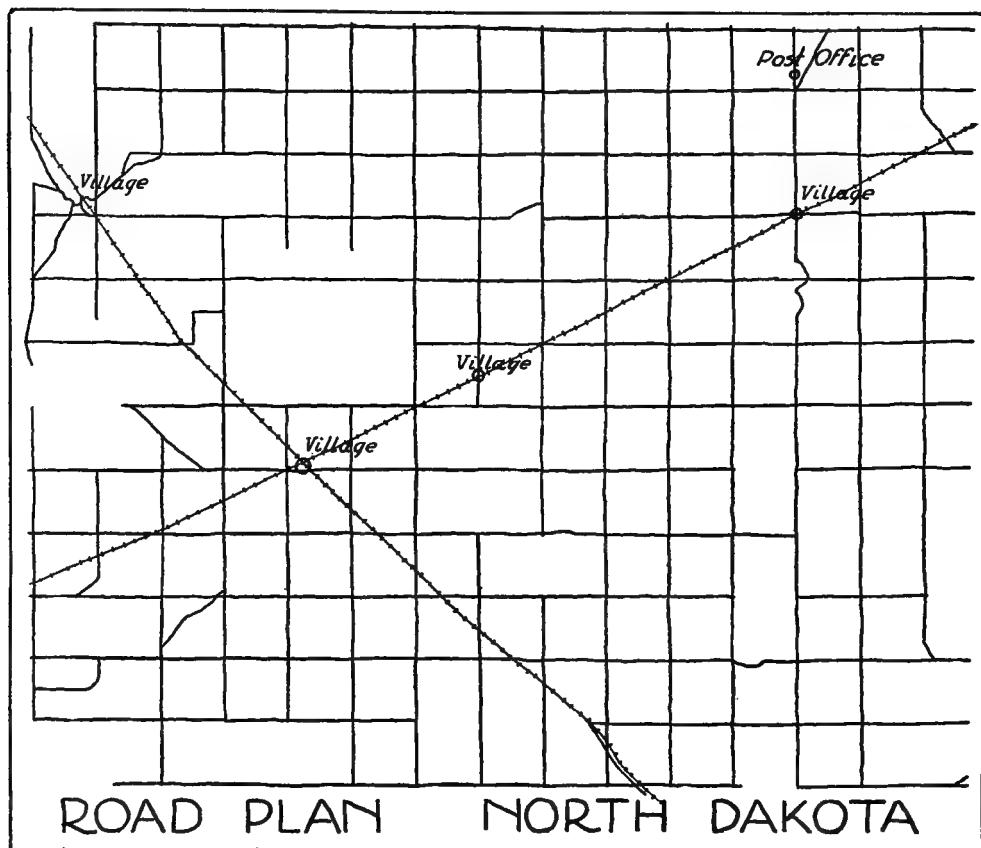


FIG. 112. TYPICAL ROAD PLAN IN GOVERNMENT SURVEY AREA

demands and which conforms to the natural topography as does the road system shown in Figure 113.

The important point in reference to the natural system (Figure 113) is that it follows the natural water courses and the most feasible topographic lines. The section here represented is in fact very hilly, almost mountainous, with high stony hills, and it would be utterly impossible to run the public roads in straight lines. Even on level land like that found in large areas of the middle western states there are objections to the lattice-work system. In many parts of the country there are more roads than are needed; in thickly settled sections there are fewer. Obviously the mileage of

COUNTRY ROAD SYSTEMS

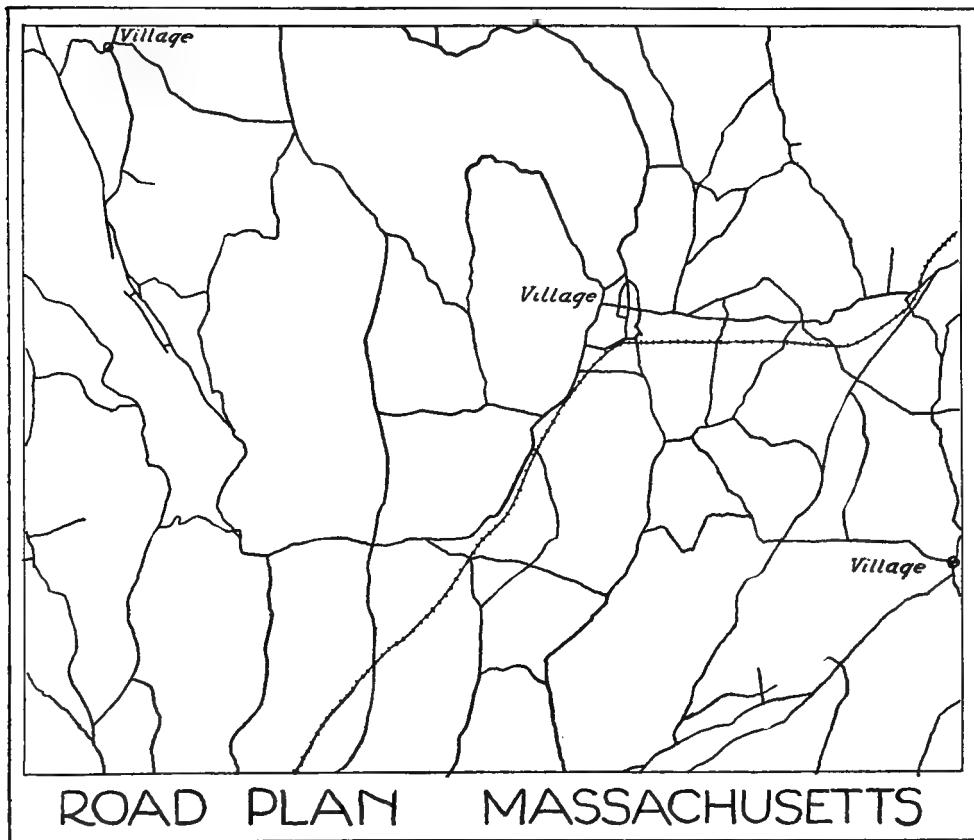


FIG. 113. TYPICAL SECTION OF NEW ENGLAND ROADS

the road system ought to be roughly proportionate to the density of population.

The arbitrary location of these roads on section lines often places them on disadvantageous terrain when even a small shift in one direction or another would have placed the road on much easier grade or would avoid bad cuts and fills or bridges.

Another serious defect of the checker-board system is the lack of diagonal lines. This is so serious that it has been corrected in a few instances and must be extensively corrected in the future. Straight, diagonal trunk lines are now needed in many places, especially between important cities and towns.

Studies

Find the necessary maps and from these draw off at large scale the road plan of your neighborhood covering at least one township. If this map can be taken from the maps of the United States Geological Survey it will be possible also to insert upon the student's map some of the contours, and these will be of much value in studying the location of roads.

The following questions should then be answered by every student. If these questions can be freely discussed in class the results will be particularly good.

1. What type of road plan is represented in our neighborhood?
2. Is it, broadly speaking, the best type for the needs of the present day?
3. What improvements might be made in details (referring only to locations)? Could some of these roads be relocated to advantage? Could some of them be closed altogether? Could any new roads be opened to the public benefit? Especially could new trunk lines be opened between important centers?

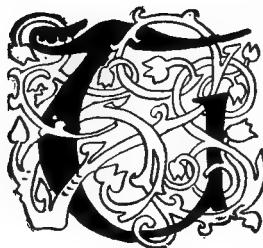
Readings

BAILEY, The New Map of the Country, in *The Holy Earth*.

WAUGH, Rural Improvement, Chap. III.

LESSON 49

TREES



THE purpose of this lesson is to acquaint the pupil with the more important species of trees used in landscape gardening, and especially those which thrive in his own neighborhood.

General Facts

Trees may be classified in various ways, according to their botanical relationships, according to hardiness, according to height, etc. A few of the distinctions most important in landscape gardening are the following:

Deciduous trees are those which shed their leaves in winter; evergreen trees are those which hold their leaves through the winter. A majority of the most valuable evergreen trees are cone-bearers (such as pine, spruce, hemlock), but there are also broad-leaved evergreens, such as the live oaks.

Exotic trees are those not native to a given region, especially those native to other continents. Native trees have certain advantages, particularly in naturalistic landscape gardening.

The size to which a given species usually grows obviously has a bearing upon its use in landscape gardening.

Studies

The pupil must become sufficiently acquainted with trees to recognize all the more important species instantly. This is obligatory. The best way to acquire this knowledge is through study of the trees themselves with the help of a competent instructor. In the absence of an instructor who knows trees the student must find

other means of positive identification. Good books for this purpose are Gray's "Manual of Botany"; Sargent's "Manual of the Trees of North America"; McFarland's "Getting Acquainted with the Trees."

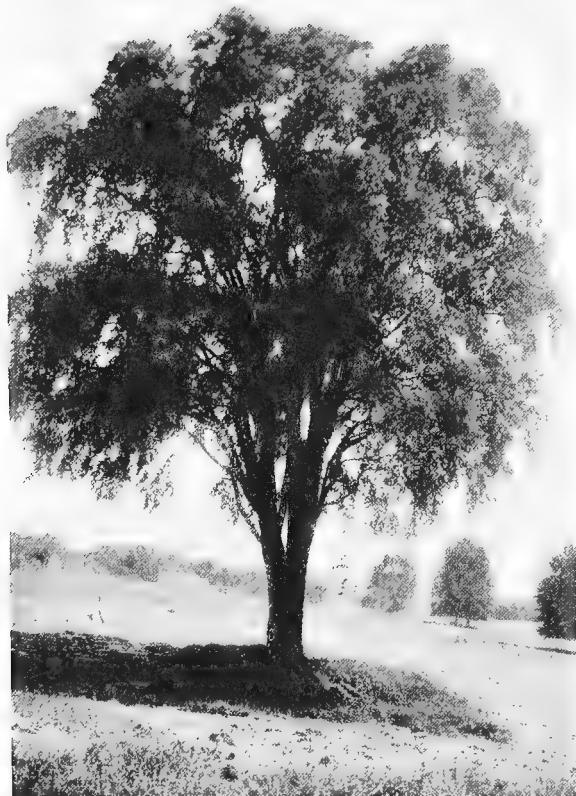


FIG. 114. THE AMERICAN ELM

and the fern-leaved beech are interesting curiosities and very satisfactory if one likes that sort of thing.

Birch: Birches have long been favorite specimens for front lawns and cemeteries. This fact indicates how uncritical is the taste which selects them. From the standpoint of landscape gardening all the birches are excellent for woodland planting, especially for the borders of park woodlands.

Catalpa: These trees are not very valuable except that they

The most important kinds of trees for landscape work are enumerated in the following lists:

Deciduous Trees

Ash: Three or four species of native ash are excellent for mass planting on suitable soils, usually bottom lands or wet situations. They are not so good as specimens or lawn trees.

Beech: The native beech is a splendid tree where it can be grown. The purple-leaved beech

will succeed in many hot, dry situations where better trees cannot be grown. The flowers are rather attractive.

Coffee Tree (Gymnocladus): This tree makes a good specimen of considerable dignity.

Elm: The American elm is the favorite street tree wherever it can be grown and it succeeds over a rather wide range. It is also a desirable specimen or lawn tree, though it must have considerable room. Aside from this one species, other elms are interesting but are of no great importance.

Ginkgo: A curious exotic from Japan worth using as an occasional lawn specimen.

Honey Locust: This species makes a good shade tree, especially on the bottom lands of the central Mississippi valley. If vigorously pruned it makes a first rate large hedge.

Horse Chestnut: Excellent for many different uses. Makes a good lawn specimen, can be sheared, (this being a frequent method of treatment in Europe) and is especially desirable for planting in narrow streets where living conditions are difficult.

Linden: The European lindens make very pretty trees in the states along the eastern seaboard. The American linden is worthy



FIG. 115. SOULANG'S MAGNOLIA

of planting occasionally, preferably on larger grounds and on good rich land in the middle states.

Magnolias: Certain species are characteristic of the South, but other kinds can be grown as far north as the Great Lakes. They are desirable mainly on account of their showy flowers.

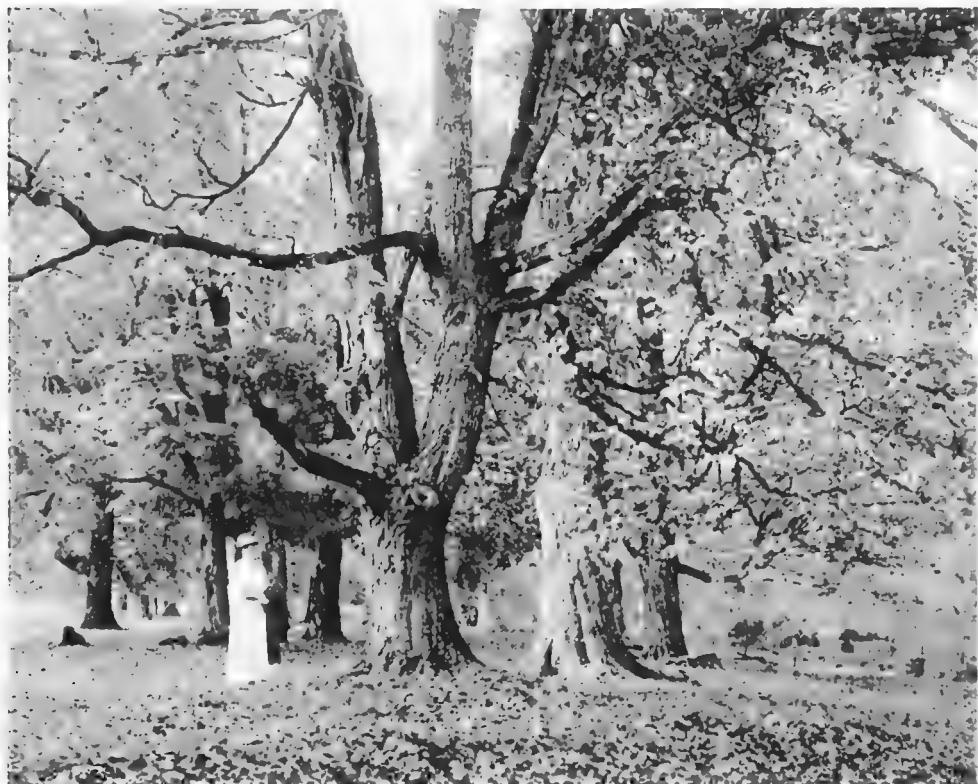


FIG. 116. THE SUGAR MAPLE

Maples: Here we have some of the noblest trees anywhere known. The common sugar maple is one of the best. The soft or silver maple is highly serviceable throughout the middle states where it is extensively used as a shade tree and for lawn planting. The Norway maple (*Acer platanoides*) makes a good lawn or street tree. The ash-leaved maple or box-elder is a very poor sort of tree except

that it will withstand severe drouth and cold and can therefore be used on the most exposed locations in the northwestern plains.

Oak: Another genus containing a number of our noblest trees. The best for landscape gardening are probably the white oak, the swamp white oak, scarlet oak, pin oak, red oak and mossy-cup oak. Popular prejudice does the oaks an injustice in believing them to grow very slowly. They are in fact most satisfactory trees wherever planted on reasonably good soil.

Poplars: These trees are particularly useful on account of their rapid growth, the Carolina poplar especially so. However they are short lived and have other defects so that they should not be planted where better trees can be grown. The Lombardy poplar on account of its peculiar form is chosen for special effects.

Sweet Gum: Suitable for the middle and southern states — an attractive tree giving bright colors in autumn.

Sycamore, Plane Tree or Buttonwood: The American plane tree makes a large showy specimen. It is most at home on moist land along streams, etc. The European plane tree is a little more



FIG. 117. BUR OAK IN WINTER DRESS

formal and makes a rather better lawn specimen. It does well for street planting where not too crowded.

Tulip Tree: (*Liriodendron*) Makes a large tree and is very satisfactory where it has room enough.

Walnut: The native black walnut is worth planting in the middle states. The Japanese walnuts make good trees when properly placed in park plantings.

Willow: There are many species of willows which can be used making excellent effects especially on low land and along water courses.

Small Trees

There are several small trees, some of them hardly more than shrubs, which are exceedingly useful to the landscape gardener. Amongst these the apple should have prominent mention. The common apple tree is a very desirable feature on many home grounds and is indeed well adapted for certain uses in park planting. The ornamental apples, such as Bechtel's and Parkman's crabs, are effective ornamental trees.

The hawthorns also fall into this class of small trees. They are of considerable importance in landscape gardening.

Various species of plums are also useful. In this list may also be placed the Buffalo berry (*Shepherdia*), valuable on the northwestern plains; also the mountain ash (*Sorbus*) valuable in the north.

Evergreen Trees

Cedars: The native red cedar or juniper makes a striking small tree which thrives on dry warm upland

Arborvitae or white cedar is a characteristic tree in northeastern states along swamps and lake shores. It is valuable chiefly as a hedge tree.

Hemlock: Makes an excellent hedge when carefully pruned and is a good tree for mass planting in cool soils with northern exposures.

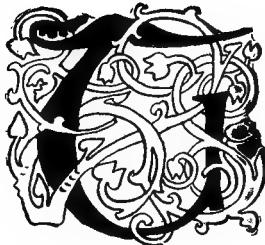
Pines: The pines are unquestionably the noblest of our coniferous trees. From the standpoint of the landscape architect they are best adapted to large mass plantings where something like forest conditions can be established. The American white pine is the best species for landscape use, though there are other kinds which are worth while under special conditions.

Retinespora: These are Japanese species extensively grown in the nurseries for ornamental effects. They are valuable for fancy groups and small masses.

Spruce: The Norway spruce is a favorite for landscape planting and though it is short lived may be widely used. The Colorado blue spruce has had an extraordinary vogue and has been greatly overplanted. The spruces make good hedge plants and wind-breaks. Outside of this use they are more valuable for large forest-like plantings than for individual specimens on lawns.

LESSON 50

HARDY SHRUBS



HIS lesson should introduce the student to the study of shrubs. It is a study however which will require long and serious application before a knowledge of these indispensable materials is secured sufficient to guide the landscape gardener in his daily work.

Discussion

Shrubs are important in every type of landscape gardening but especially in the free naturalistic style as practiced in England and America.

American practice, based upon sound esthetic reasons, gives strong preference to hardy native species. Besides those species strictly native to this continent there are a number so far domesticated as to be accepted to horticultural citizenship without further question. Amongst these the garden lilac stands preeminent, but other shrubs which are so fully naturalized as to be used freely in any plantings are mock orange (syringa), some of the spireas, the Japanese barberry and the privets.

Shrubs are particularly useful in making foundation plantings, in forming screens or borders along boundaries, and in foreground planting in front of trees.

Shrubs should nearly always be massed, several plants of a species being put together with few species in any one group. To harmonize several species in one group requires considerable skill and should be undertaken only by landscape planters of experience. Shrubs are seldom very attractive when used as single specimens,



FIG. 118. THE SPRINGTIME SHOW OF LILACS

a method of planting too frequently seen on the grounds of laymen who have no education in horticulture or landscape gardening.

The following list includes the more important genera and species:

Alder: The alders are coarse shrubs or small trees best suited to planting along water courses, the margins of ponds or in swampy land.

Azalea: Several species are very attractive in blossom. The most popular are perhaps the swamp pink (*A. nudiflorum*) and Vasey's azalea (*A. Vaseyi*).



FIG. 119. RHODODENDRONS IN FLOWER

Amorpha or *false indigo* makes a large coarse shrub with pinnate leaves and is suitable for coarse background planting.

Aralia, *Angelica* or *Hercules Club* makes a large coarse tree-like shrub suitable for special effects.

Acanthopanax pantaphyllus is a hardy vigorous thorny shrub of considerable value in general landscape work.

Barberry: The barberries will stand considerable shade and are valuable on this account. They also make good hedges. The Japanese barberry is particularly hardy and neat and has accordingly been extensively used in mass plantings, shrubbery borders, foundation plantings, etc.

Buckthorn (Rhamnus): An excellent hedge plant formerly

HARDY SHRUBS

quite popular and worthy of more general planting at the present time.

Buttonbush (Cephalanthus) is a coarse, hardy, rather attractive shrub suitable for planting along pond shores.

Caragana or Siberian pea tree is valuable chiefly because of its exceeding hardiness.

Currant: Several members of this genus, especially the Missouri currant, make good shrubs.

Deutzia: This group includes some of the best lawn shrubs, especially *D. gracilis* and *D. lemoinei*.

Dogwood: Several of the dogwoods are highly desirable for landscape work. Those to be especially mentioned are the red branched species, *Cornus stolonifera*, *C. alba* and *C. sanguinea*, also the white fruited dogwood *C. candidissima*. The very popular flowering dogwood *C. florida* is more of a tree than a shrub.

Elder: Two native American species of elder are valuable for park work.

Forsythia: Three species are commonly offered in nurserymen's catalogs, all of them highly valuable for all kinds of landscape planting.

Fringe Tree (Chionanthus): A large coarse rather showy shrub of only moderate value.

Hydrangea: The common *Hydrangea paniculata grandiflora* is one of the most showy shrubs grown and too much used on that account. Another over-popular sort is Summer Snowball (*Hydrangea arborescens sterilis*). The oak-leaved hydrangea is also a good shrub.

Honeysuckle: Several species of honeysuckle make good shrubs, especially the Tartarian (*Lonicera tartarica*) and Morrow's (*L. Morrowi*).

Kerria: A small fine shrub excellent for foundation plantings and other close work.

Japanese Quince: A good shrub which has gone somewhat out of fashion in recent years. Makes an excellent hedge.

Lilac: This is one of the old favorites and most meritorious

of all shrubs. It is best to use the carefully selected named varieties. The lilac by its domestic character is especially suited to home grounds.

Ninebark, sometimes called *Spirea opulifolia*. A large coarse-limbed shrub excellent for mass planting.

Oleaster or *Elæagnus*: Two or three species of excellent hardy small shrubs.

Redbud (*Cercis* or *Judas Tree*): Showy in early spring but otherwise of no great value.



FIG. 120. THE NATIVE PRAIRIE ROSE — *Rosa setigera*

Rhododendron: This group includes some of the most important broad-leaved evergreens. The growing of rhododendrons is something of a specialized art and there are many localities where they cannot be grown even with the utmost skill. Where they succeed they are very showy and useful.

Roses: There are many species and varieties of hardy shrubby roses which are valuable in park planting. Perhaps the prairie rose (*R. setigera*) is the best of these. Many of the dwarf ramblers, multiflora roses, sweet briars, the Japanese *Rosa rugosa* and other varieties must be given careful consideration in any sort of planting.

Pachysandra: A very low growing herbaceous shrub especially valuable as a ground cover.

Pearl Bush (Exochorda), a large upright rather coarse shrub with cheerful white flowers.

Privet: There are several species of privet, all of them highly valuable. They will grow in shady spots where very few species will succeed. Their hardiness and their glossy green foliage make them excellent in foundation plantings and general shrub masses, while they are hardly surpassed anywhere for hedge plantings.

Spice Bush (Calycanthus): Useful in general shrubbery masses.

Spirea: This genus contains a number of species of the highest value in landscape work. The most popular are the Bridalwreath (*S. Van Houttei*) *S. Thunbergii*, *S. callosa*, *S. prunifolia* and the popular but ill-colored Anthony Waterer.

Snowberry: A delicate, attractive shrub valuable for its white berries borne through the autumn and winter. To this genus *Symporicarpos* belongs also the Coralberry, a good hardy shrub with pink fruit.

Sumac: The best species in this important genus are the smooth sumac (*Rhus glabra*) the stag-horn sumac (*R. typhina*) and the aromatic sumac (*R. aromatica*).

Syringa, Mock Orange or Philadelphus, one of the old favorites: A large strong-growing rather coarse shrub with beautiful fragrant, white flowers. Some of the newer hybrid varieties are excellent.

Viburnum: A number of species in this genus are valuable for garden planting. The best ones are *V. acerifolium*, *V. cassinoides*, *V. dentatum*, *V. lantana*, *V. lentago*, the high-bush cranberry (*V. opulus*) the snowball (*V. opulus sterilis*) the Japanese snowball (*V. tomentosum plicatum*). These are all hardy and easily grown.



FIG. 121. WITHE-ROD, *Viburnum cassinooides*

Weigelia (Diervilla): Hardy flowering shrubs and generally useful.

Willows: There are many shrubby species of willows which can be effectively employed in landscape planting. Many of these are most effective in shrubbery plantings when cut back every year or two and allowed to sprout from the ground.

Study

It is essential that the pupil give extended and faithful study to this interesting and endless subject. Acquaintance should be made with all the shrubs cultivated in the vicinity, and they should be

positively identified with their proper names. The pupil should then make an extended notebook recording the height to which they grow, time of flowering, character of flowers and foliage, soil requirements and any other practical information which may come to light.

Every school grounds and college campus should have, as a matter of course, a good collection of trees and shrubs planted partly with a view to teaching of this sort. But every good teacher will extend his instruction far beyond the home campus, and will visit the best parks, private grounds and nurseries within reach. Equally detailed and careful attention should also, as a matter of course, be given to the study of native materials growing in the wild.

Readings

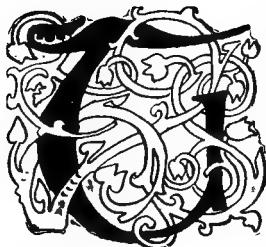
Bailey's "Standard Cyclopedia of Horticulture," invaluable at many other points, is particularly useful for its descriptions of shrubs.

The catalogs of good nurseries constitute about the best literature available in this field and every teacher should collect a supply for his classes.

Kirkegaard's "Trees, Shrubs, Vines and Herbaceous Perennials," Boston, 1912, is a specially handy reference work.

LESSON 51

CLIMBING VINES



HIS lesson is designed to introduce the subject of climbing vines and their use in landscape gardening.

Uses

Vines are employed in landscape gardening for several different purposes. Doubtless the most popular use is upon house porches where vines are grown for shade, ornament and to give some privacy. Climbers of other kinds, such as Japanese ivy, are used on brick, stone or stucco walls, sometimes even upon wooden buildings, mainly for ornament. Rightly used they add greatly to the beauty of certain buildings. On pergolas, arbors and summer houses vines become an absolute necessity. They are effectively grown also on fences, whether of wire, wood or stone. They are sometimes used to clamber down rough banks. Finally they are used for covering unsightly objects.

Vines should never be used without a definite purpose. When one finds a vine (rose or clematis) planted in the midst of a lawn for which a special trellis must be provided merely to support the vine, it is then obvious that the vine had no original business there. Any purposeless planting of this sort has a highly evil psychological effect in gardening as in all other arts.

List of Varieties

The following list includes the vines most useful in general landscape planting:

Actinidia: This husky-growing Japanese vine thrives in the northeastern states. It is rather too rank for house porches, but

CLIMBING VINES

its clean growth and complete freedom from disease or insect attack make it fairly satisfactory nevertheless.

Bittersweet: Two or three species of bittersweet are all good, but the native (*Celastrus scandens*) is the most desirable, especially on account of its bright orange fruit.



FIG. 122. ACTINIDIA AND TRUMPET VINE

Clematis: This genus also contains a number of attractive ornamental species some of which are climbers, some trailers and some merely shrubs. The most popular climber for use on house porches is probably the Japanese species (*Clematis paniculata*). The species with large purple flowers (*C. Jackmanii*) is also much admired. The native Virgin's Bower is particularly adapted to covering stone fences and similar rough work.

Dutchman's Pipe (Aristolochia): A strong-growing, hardy vine with very large dark green leaves. This should be used where heavy cover is desired. It is not so well adapted to house porches.

Grapes: All the native American grapes are good climbers and

are very satisfactory in this role from the landscape gardening standpoint. They are especially adapted for use upon pergolas, and are not wholly impossible on house porches, especially if used at the rear of the house. The named horticultural varieties bearing superior fruit should be chosen in preference to others, although the native Frost grape is desirable on account of its foliage and habit of growth.



FIG. 123. CLEMATIS OR VIRGIN'S BOWER

Honeysuckle: The species of this genus (*Lonicera*) are not very good climbers although the old-fashioned trumpet honeysuckle (*L. sempervirens*) is worth some trouble. Hall's honeysuckle is more of a clambering or trailing vine and is very good for covering fences, banks and waste places generally.

Roses are very popular in the role of climbers. The ever-popular Crimson Rambler has been too widely planted, especially where it appears against brick walls or in other surroundings in-

CLIMBING VINES

harmonious with its vivid color. Varieties like Lady Grey, Dorothy Perkins and others of less brilliant hue are more generally satisfactory when used immediately against dwelling houses. There are in fact a great many good varieties of climbing roses and popular selection should not be so strictly limited to a single sort.

Trumpet Flower (Tecoma): A large coarse-growing vine best adapted for large work on out-buildings. It has attractive flowers.

Woodbine: The native woodbine is one of the most generally satisfactory climbers in the entire list. A closely related species (*Ampelopsis heterophylla*) is an attractive climber and worthy of more general use.

Wistaria: A strong hardy climber with very attractive showy flowers. An old-fashioned favorite.

Annuals: Several annual plants are used as climbers, the best being morning-glory, the climbing cucumber (*Echinocystis*) and the hop vine.

Study

As in dealing with other groups of plant materials the pupil should make long and thorough studies of climbing vines in field and garden. Extended notes should be taken. The help of a teacher or of several teachers should be sought.

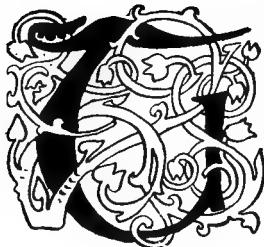
Readings

The best nursery catalogs give much useful information on vines.

Kirkegaard's "Trees, Shrubs, Vines and Hardy Perennials," already referred to, is useful.

LESSON 52

HARDY PERENNIALS



HIS lesson should introduce the pupil to the study of hardy perennials, their names, their visual characters, their habits and requirements, and their uses in landscape gardening.

Uses

Hardy perennials play a considerable role in landscape gardening. In home gardening and in the making of small formal gardens they quite frequently take the front of the stage. They are especially desirable in developing "old-fashioned flower gardens." In the more florid types of park making they are extensively used. In general they are desired for their bright flowers and should be preferred to tender annuals or greenhouse goods which succumb to the first frosts of autumn and which have to be replaced at considerable expense each spring.

Leading Kinds

There are hundreds of genera, thousands of species and millions of varieties of these hardy perennials. New kinds are being introduced faster than the ablest experts can learn their names. The only sensible course for the layman therefore is to learn to know a few of the best groups, especially the most old-fashioned of all, such as the day lilies, the asters, the peonies, the irises and the larkspurs. Even these he will know by a few leading varieties instead in the myriads of sorts grown by the connoisseurs. He can well console himself with the certainty that the oldest and most popular varieties are in all probability the best.



FIG. 124. DAY LILY — *Hosta caerulea*

This principle of limiting one's self to a comparatively small list of the oldest and commonest plants has to be adopted by the professional landscape gardener, in fact, as well as by the layman. It is merely a question of drawing a line. The landscape gardener should know a considerably longer list of plants than the grocery-man or the banker; the professional plantsman will know a great many more than the landscape gardener; but even the nuttiest plantsman must stop somewhere. No living man, sane or crazy, can know all the good plants in the world.

The first duty of the student, therefore, is to ascertain what are the leading genera of old-fashioned plants, next to learn what are the best species or varieties in each group. This can be done only amongst the plants themselves, whether they are growing in gardens, nurseries or in the wild. All these separate sources should be utilized. The plants should be studied everywhere.

A good teacher is highly desirable in these studies, but much can be done alone if the pupil has the courage and industry to keep to it. Wild species may be identified from Gray's "Manual of Botany" or from other good manuals. Many sorts can best be



FIG. 125. JAPANESE GOLD-BANDED LILY

looked up in Bailey's "Standard Cyclopedia of Horticulture." Kirkegaard's "Trees, Shrubs, Vines and Herbaceous Plants" is a helpful handbook. The nurserymen's catalogs should be consulted.

The following list enumerates the groups and a few of the species usually preferred:

Anemone: The anemones or windflowers are always interesting. The best species for garden planting is the late Japanese anemone.

Asters: The native American asters are splendid hardy plants when properly placed and cared for. The New England aster is a great favorite, but at least a dozen different species are worth planting.

Columbine (Aquilegia): Dainty flowers, native, imported and hybrid, mostly suitable for well-kept gardens.

Coreopsis: Hardy species with bright yellow flowers for garden planting.

Day Lily (Hemerocallis): This group contains a number of species and varieties some of them much better than others. The lemon lily (*A. flava*) is popular and attractive. Florham is a larger and finer variety. Some of the dwarf early orange flowering species such as *Middendorfii* are also good.

The popular name day lily is also applied to the *Hostas* or *Funkias*, of which there are some good sorts especially *H. cerulea* and *H. grandiflora alba*.

The evening primrose (*Oenothera*) group contains several fine showy yellow flowering varieties good for the hardy border.

Ferns: Several species of hardy ferns are excellent for landscape planting. They are adapted to many different conditions and soils and to various landscape uses.

Foxglove: A brilliant hardy popular plant always attractive in perennial borders.

Goldenrod: This peculiarly American genus includes several very attractive species. Most of these can be cultivated in the garden to good effect or can be used in perennial borders when some thought is given to their proper surroundings.

Helenium, sometimes called sneezeweed, which is not a very attractive name for a really good plant. These are tall lusty plants with showy flowers coming into bloom in the latter part of the summer.



FIG. 126. PEONY FESTIVA MAXIMA

Hollyhocks: Old garden favorites, a little difficult to grow but worth the trouble.

Iris: This group includes thousands of varieties of many different groups. The most important are the German iris, Japanese iris, Siberian iris. These are splendid garden plants which may be planted almost anywhere and should be freely used.

Larkspur: Always desirable on account of their pure and beautiful colors, mostly various shades of blue. These are particularly suitable for borders of hardy perennials.

Lily: The old-fashioned tiger lily is the hardiest and safest of this group and has various uses in the garden. Several other species grow well in the herbaceous border especially *L. elegans* and its varieties. Other species do better planted under shrubbery. In this list may be included *L. speciosum*, *L. candidum*, *L. auratum*, *L. henryi*.

Phlox: The hardy perennial phloxes can be had from the nurserymen in a long list of varieties. Special effort should be made to select hardy varieties of good colors harmonious amongst themselves.

Pentstemon: Several species of this genus make attractive border plants.

Peony: Here we have one of the finest of all garden flowers. It is old-fashioned and new-fashioned, many splendid varieties having been recently introduced. Perhaps the best of all for general planting is *Festiva Maxima*. Peony plants should be left alone undisturbed for a number of years in order to get the best results.

Poppy: The hardy oriental poppies are very showy and may be freely used in border plantings.

Rubekia: The popular flower in this group is the well-known "Golden Glow." Of more value are the improved varieties of the "black-eyed Susan" such as *R. fulgida* and *R. newmanii*.

Spirea: The herbaceous spireas (*Ulmaria*) or dropworts are most attractive plants worthy of general culture.

Sunflower: Two or three species of hardy sunflowers make excellent border effects. They are rather large and coarse and should be kept well in the background.



FIG. 127. SUNFLOWERS

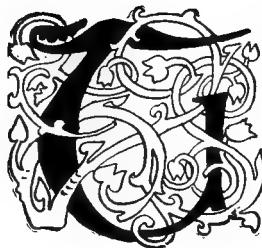
Studies

The student should spend much time in the field identifying plants and making written notes. In this note taking he will find the card system best. Cards should be of standard library sizes, either 4" x 6" or 3" x 5". If printed forms can be made up they will help in getting a good set of notes. The form shown below has been used for some years at Massachusetts Agricultural College and found satisfactory:

BOTANICAL NAME.....
COMMON NAME.....
Range.....
Form..... Height.....
Twig.....
Leaf.....
Flower.....
Fruit.....
Soil.....
Propagation.....
Landscape use.....

LESSON 53

FOUNDATION PLANTING



HE object of this lesson is to learn some of the principles governing foundation planting and to become familiar with some of the materials best adapted to that work. This study applies especially to the requirements of a modest dwelling house on a small village lot.

Definition

The term foundation planting is applied to groupings of shrubbery, vines and herbaceous plants (rarely including small trees) placed about the base of a dwelling house, schoolhouse or any other public or private building. The most usual objects of such a planting are (a) to cover up high and unsightly foundations, (b) to break up hard and formal lines in the architecture, (c) to unite the building with the grounds, (d) to secure privacy. Practical observation will show that nothing does more to make a dwelling house or other building seem naturalized to its surroundings — to assume a cosy home-like air — than judicious foundation plantings.

Problem

The small dwelling house here presented was designed by Walker and Gillette, architects, for the proposed war-time development at Ilion, N. Y., under direction of the United States Housing Corporation.* This is a small house of six rooms and bath, of excellent

* U. S. Housing Corporation Report, War Emergency Construction, Vol. II, p. 186, U. S. Department of Labor, Washington, 1919.

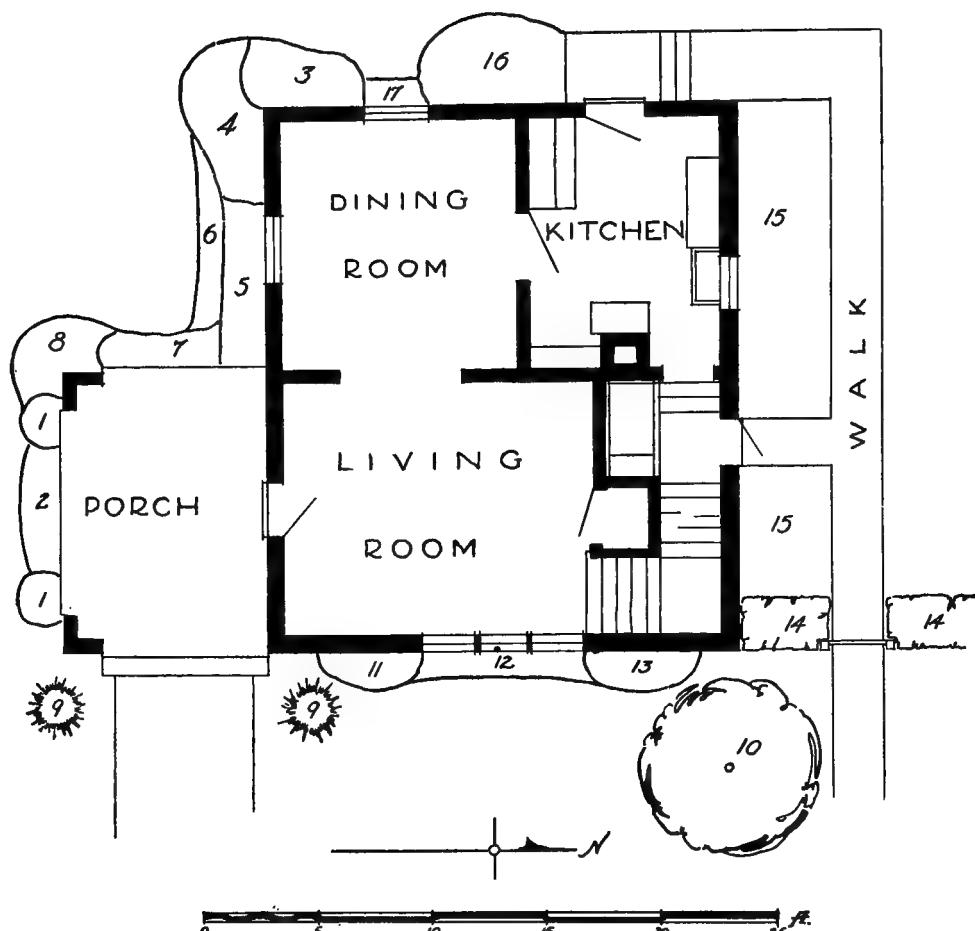


FIG. 128. FOUNDATION PLANTINGS

1. Rose, Crimson Rambler	7. Kerria japonica	13. Cydonia japonica
2. Deutzia Lemoinei	8. Lilacs	14. Privet hedge, pruned
3. Spirea Van Houttei	9. Pyramid arbor vitae	15. Border of ferns and other shade-loving plants
4. Philadelphus coronarius	10. Kohlreuteria paniculata	16. Ampelopsis heterophylla
5. Euonymous radicans	11. Symphoricarpos racemosus	17. Peonies
6. German Iris	12. Xanthorhiza apifolia	

design and of a type likely to be highly useful in many parts of North America. (See also Figure 61, page 114.)

In the present problem all other portions of the grounds are disregarded except those immediately adjoining the house, but it is

FOUNDATION PLANTING

assumed that this house stands on a small lot of level ground, that it is placed near the street and that the porch faces the south as indicated by the arrow on the plan.

The pupil should redraw this plan in full detail to a suitable scale. He should then make a careful study of the planting list as given and should identify all the species therein listed. He should



FIG. 129. GOOD FOUNDATION PLANTINGS ON HOME GROUNDS

make every effort to visualize the finished result and to understand why each group of plants have been placed in the position indicated.

This being done it will be important for the pupil to make a new planting plan giving his own ideas of appropriate foundation plantings for the same house but using other material. In this restudy the pupil should first have especial regard to the selection of plants suitable to his own locality, and second he should be careful to satisfy his own preferences. Such plantings are, to a large extent,

matters of taste; and unless the pupil exercises his own taste he will hardly make any improvement in this important matter.

Observations

It is important to observe that the house as designed by the architects is placed unusually low. While this is certainly an advantage from the standpoint of artistic effect, it greatly reduces the necessity for foundation plantings.

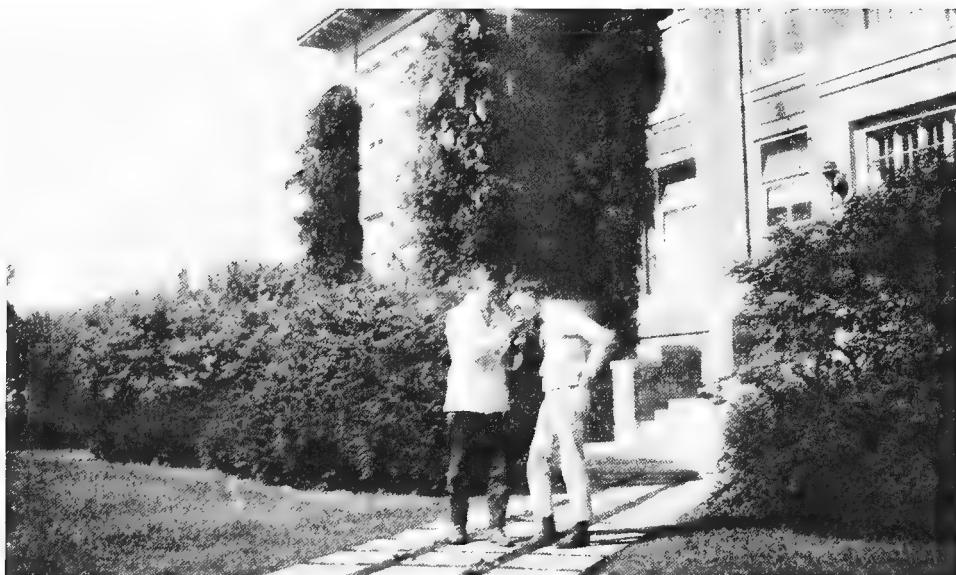


FIG. 130. FOUNDATION PLANTINGS INCLUDING VINES ABOUT A LARGE BUILDING

Next it may be said that the planting list here offered is unnecessarily long. More species are included than should be chosen were our purpose simply to give the utmost dignity of artistic effect. The larger selection of plants here used may be justified, however, on the ground that, on a small home lot of this character, the foundation plantings constitute a large portion of the entire garden. It is desirable therefore to have a considerable variety of plants for the sake of the interest which the owners have in such things, and

FOUNDATION PLANTING

also for the very practical reason that different species are at their best at different seasons of the year.

If the pupil has sufficient time on this problem it will be excellent exercise to prepare plans for foundation plantings using only two or three species. Such plantings can be made highly effective, but they hardly satisfy the personal interest of a family which really cares for plants, or indeed any family which has any well developed home interest.

General Principles

In designing foundation plantings it is well to bear in mind certain principles. It is important to remember, for example, that these foundation plantings are a wholly secondary item. They are secondary to the house, and they should be secondary also to the broader plan for the entire grounds. Foundation plantings should not therefore claim attention to themselves.

This means definitely that showy plants of every sort, such as have bright colors or unusual forms should be rigidly excluded from the foundation plantings. On the other hand one should select quiet colors and textures and plants which are neat and homely in their character. The "old-fashioned plants," such as have been long associated with domestic life, are especially suitable.

Inasmuch as these plantings are nearly always viewed at close range it is further desirable that the textures be relatively fine. Coarse textures and bright colors should be used only at a distance.

LESSON 54

SHRUBBERY BORDER



UR purpose here is to familiarize the pupil with the use of shrubbery in landscape gardening, especially the methods very commonly followed in planting small home grounds. On such places, of moderate size, whether in the city, the suburbs or on the farm, borders and screens of shrubbery are of the utmost value. The selection of good species and varieties and their grouping into pleasing combinations, is one of the commonest garden problems.

Conditions

In the present problem it is desired to produce a screen separating our own grounds from those to the north and to form an attractive background for the lawn and grounds in front. The two ends finish upon boundary lines running at right angles. It is desired to have shrubs of sufficient variety to make the planting interesting and to present something of beauty throughout the summer.

Problems

The student should undertake one or more of the following exercises:

1. Redraw this planting plan to scale, and identify all the species as named. Effort should be made to vizualize the finished planting — to imagine just how this border will look when mature. The plan here is first drawn to scale in pencil and then inked free-hand. This method is recommended to the pupil.

SHRUBBERY BORDER

2. Substitute other species for those named in this planting plan. Such a study in substitutions will be especially desirable for students in sections of the country where these species are not at home, that is outside the north-central and north-eastern states.

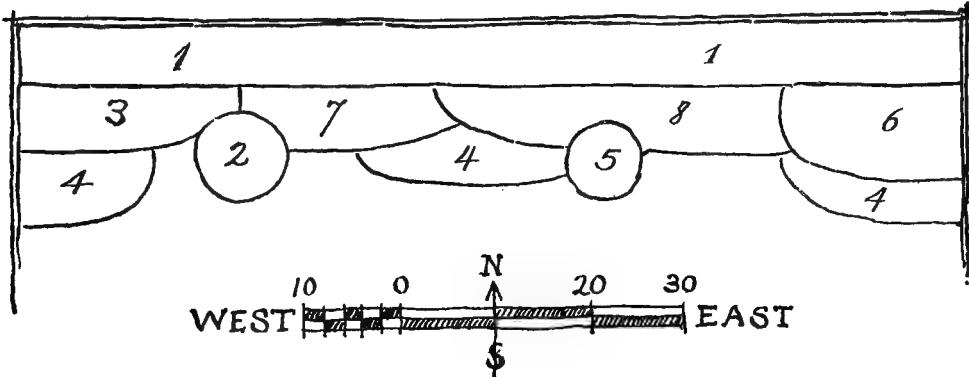


FIG. 131. SCREEN AND BORDER

1. <i>Forsythia viridissima</i>	2. <i>Malus floribunda</i>
3. <i>Rhus glabra</i>	4. <i>Kerria japonica</i>
5. <i>Amygdalus nana</i>	6. <i>Lonicera morrowi</i>
7. <i>Dievrella rosea</i>	8. <i>Cydonia japonica</i>

3. Make a substitution study using chiefly or exclusively evergreen species.

4. Make a similar planting plan for another measured border on some tract of land within reach of the class. Due regard should be paid to orientation, slope, character of soil and other conditions. This exercise is the most valuable of all and should not be omitted. Rather should the class work out several such plantings.

Instructions

A knowledge of the trees and shrubs to be used is obviously essential to any intelligent work upon this problem. The student must familiarize himself with species in the field — as many species as possible and as intimately as possible. The teacher should make the largest practicable provision for acquiring this indispensable knowledge of materials; but it must not be supposed that a famil-

arity with trees and shrubs is the main part of landscape gardening, as some persons appear to think.

In all such plantings use comparatively few species. The plan now reproduced has too many. Four different kinds would make a better design than the eight here used; but the larger number is adopted in here in order to increase the interest during various seasons of the year.

It is essential that each species be used in mass. There should be ten or a dozen of a kind, and from that number up to 100 of each sort.

Contrasted with these mass plantings occasional individual or specimen plants may be used. These should be of the finest sorts and should appear at the accentuated points in the planting (nodes or paragraphs). In the accompanying plan the flowering crab (*Malus floribunda*) and the dwarf almond (*Amygdalus nana*) are used in this way.

A very common fault in such plantings is the employment of too many species and too few plants of a kind.

In work of this sort avoid plants with coarse texture or of unusual colorings, especially all variegated sorts and those having red or yellow foliage. Such homegrounds plantings are subject to the same rules of taste as the furnishings in the interior of the house or the clothes which one wears about his daily business. Anything "loud," coarse or conspicuous is evidence of a taste uncultivated and unrefined.

Questions

Where is the best shrubbery planting in your neighborhood? If good plantings are accessible it will be well worth while for the pupil to make measured plans of them, identifying all plants and entering the names on his plan.

Under what circumstances might such conspicuous trees and shrubs as Schwerdler maple, Pissard plum, variegated weigelia, golden syringa, etc., be used?

LESSON 55

MIXED BORDER



HERE we have an opportunity to study a simple planting and to see how it is worked out by a judicious selection and combination of trees, shrubs and herbaceous plants.

Procedure

It will be worth while for each pupil to copy this plan and elevation at a larger scale; but the teacher may omit this work if he considers the time thus saved is worth more than the practice in drawing.

The next step will be to study the materials used in this composition. The trees are cherry, Carolina poplar, silver maple, and crab apple. The shrubs are Spirea Van Houttei, Eleagnus, Viburnum opulus, Cornus alba, Lonicera Morrowi and three Juniperus virginiana (red cedars) which may be regarded as shrubs. Besides these there is a border of herbaceous perennials and annuals. The pupil should be perfectly certain that he knows each one of the species here used and can recognize it in the field.

Study

The following observations should be worked out by the pupil:

1. The planting runs in paragraphs. That is there are points of emphasis separated by stretches of less importance. The taller trees mark the paragraphic points.
2. The planting also falls into horizontal zones. The trees form an upper and rear-ward zone, the shrubs stand in front of and

below the trees; the herbaceous plants come next; finally the mowed lawn comes in front of all.

3. Paragraphic points or points of emphasis should coincide in all zones.

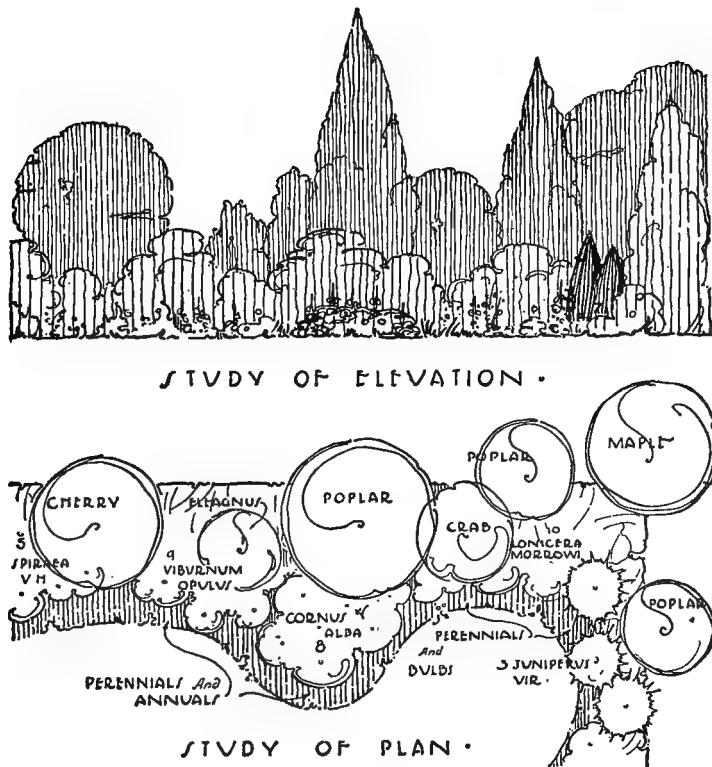


FIG. 132. STUDY FOR A MIXED BORDER

4. Bright colors should appear in the nearer masses against neutral or darker backgrounds.

5. Highly refined plants with delicate leaves and pretty flowers should be placed in the foreground; those of coarse texture in the background.

6. For best effect the sun should fall on the accentuated points, the shadows should fall in the interspaces. Roughly speaking the shadows are controlled by recessing the front line of the planting.

Problem

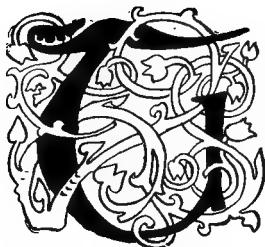
Each pupil should now work out a simple problem for a screen planting covering 50 to 100 feet of border. These plans should be criticized in detail by the teacher, but the criticism which comes from a free comparison of all plans submitted by a class is also valuable.

Credit

This plan is taken from "The Landscape Garden Series" edited by Mr. Ralph Rodney Root, landscape architect, of Chicago.

LESSON 56

THE NATIVE LANDSCAPE



HE purpose of this lesson is to introduce the student to the study and appreciation of the natural landscape, and to indicate the relation of such study to the art of landscape gardening.

Argument

It ought to be axiomatic that landscape gardening draws its materials and ideals from the landscape. Even the most restricted form of architectural design still presents a landscape, a landscape doubtless diluted, and more like architecture than like the forest. Yet insofar as it is not architecture — which is to say in just so far as it is landscape architecture (i.e., landscape gardening) — it is landscape.

It will be readily agreed that the native landscape serves with special efficiency in supplying materials and models for that form of landscape gardening which we call the natural style. This style is highly regarded in America. It is hardly too much to say that it enjoys a large preference among professional landscape gardeners in America and an overwhelming favor among the laity. Yet the materials, the form and the spirit of the open landscape should be sympathetically understood by every landscape architect, no matter how narrowly his practice may be restricted to the most formal work.

The great popular appeal of the native landscape and the close relation of landscape gardening to it are especially exemplified in the rise of the American system of National Parks. These represent quite clearly and categorically the American love for wild nature, and the development of such a system of parks quite as clearly calls



FIG. 133. LIZARD HEAD PEAK, COLORADO

for the exercise of the best talent in the profession of landscape gardening. In estimating the scope and power of this spontaneous popular movement one must count with the National Parks of the United States, also the National Parks of Canada, the National Forests of both countries, the National Monuments, the state parks and state forests. All of these are largely used for purposes of recreation and health, which uses are intimately related to the preservation of the natural landscape.

At this point it is important to consider just what service the landscape gardener may perform in relation to these vast reserves

of native landscape. Broadly stated his professional duties fall under three headings.

1. To conserve and protect the landscape.
2. To make it accessible to human beings.
3. To interpret the landscape.

Under the first head the landscape gardener cooperates with other agencies in the endeavor to secure adequate reserves of land and water (scenery) in various forms (state parks and forests, national parks, forests and monuments, etc.) to protect these from misuse and private exploitation (often a very serious task), to secure adequate financial maintenance, and to provide the most efficient means of administration. Under this head fall also such matters as fish and game protection, the provision of wild life sanctuaries, the preservation of historical and archaeological antiquities and the immeasurably important problems of forest fire protection.



FIG. 134. MULTNOMAH FALLS, OREGON

In making the landscape accessible the landscape engineer must first of all make sure

that the various available areas are severally put to their highest uses. Some will be best for free camping, others for municipal and industrial camps, some for sanatoria, some must be kept untouched on account of their extraordinary natural beauty. Such questions being determined, the landscape engineer will provide the necessary means of circulation—railroads, automobile roads, trails, etc., will locate the various camps, hotels, sanatoria, will provide for water supply and sanitation, and make all other provisions necessary to the end that men, women and children may easily reach the landscapes reserved in their behalf and may comfortably and safely enjoy them.

The interpretation of the landscape is a higher and more difficult function, not to be fully expounded in a paragraph. We may make use of the analogy of the musician who interprets the compositions of the classic masters. Thus the pianist Bauer is said to be an interpreter of Litzt, while anyone who has



FIG. 135. ONE OF THE MILLIONS OF BEAUTIFUL
CANADIAN LAKES

heard Fritz Kreisler play selections from Bach has felt that that classical and difficult music was made much clearer and more intelligible through the interpretation of the great violinist.

In like manner the professional landscape architect should be first of all an artist, capable of seeing, feeling and understanding better than the average man the beauties of the landscape, and capable, too, of interpreting these beauties to others. Obviously this is not an easy matter either to practice or to explain, but it is none the less of the greatest importance.

Practical Study

For the beginner the most fruitful study can be directed to forming an intelligent acquaintance with the landscape, beginning with the landscape which surrounds him in his own home.

The pupil ought to become personally familiar with as many types of landscape as practicable. Such types are almost endless, but the following list includes what seem to be most important:

1. Plains and prairies.
2. Mountains.
3. Hills.
4. Forests.
5. Lakes.
6. Rivers.
7. The sea and the seashore.
8. The cultivated fields.

Besides these are many others, some merely sub-divisions of those enumerated above, others quite independent, such as brooks, deserts, volcanoes, glaciers, etc.

The student must begin by mastering the landscape of his own home. This means that he must know it in detail and must love it supremely. If his own home landscape seems dull and uninspiring, no matter where it may be, he will never be able to appropriate and spiritually assimilate any other landscape. Let each

THE NATIVE LANDSCAPE

student therefore prepare in writing his answers to the following questions:

1. What type of landscape is predominantly represented in our neighborhood?
2. What other types may be found within easy reach?
3. What is the best piece of scenery in this neighborhood?
4. Where may the one best outlook or view be obtained?



FIG. 136. THE GRAIN FIELDS ALWAYS MAKE A BEAUTIFUL LANDSCAPE — COLORADO

5. For the development of natural scenery where is the best stretch of road in this vicinity?
6. Are there parks, picnic grounds or other reservations comprising natural landscape in this vicinity? Are there areas of special beauty, such as lakes, streams or woods, which should be so reserved?
7. Is there good fishing and hunting in the neighborhood? Are there lakes, ponds or streams which might be stocked for public use?

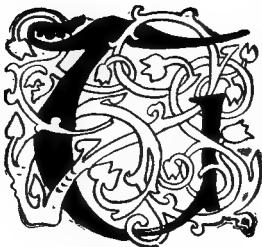
8. Is there a good "swimmin' hole" — one or more? Might there be other swimming holes established? Are these on private land? Could and should such facilities be made public? Should there be similar bathing facilities available to the girls?

These questions should not be answered from memory and upon snap judgment but upon mature reflection and frequent re-examination of the land. After each pupil has matured and written out these answers the questions should be taken up in detail for group discussion in class. It is neither probable, necessary nor desirable that full agreement will be reached on all such questions. What is important is that they shall be freely and fully considered and that each pupil shall develop a genuinely personal point of view regarding such matters.

Making photographs of scenery during such studies will be found most helpful, and an exhibition of such photographs with contributions from many students will have great educational value.

Readings

WAUGH, *Landscape Beautiful*, Chap. I
VAN DYKE, *Nature for its Own Sake*.



LESSON 57

THE COUNTRY ROAD

HIS lesson is designed to call attention to the beauty and high social serviceability of the country roads, more especially of the secondary roads and those not largely used for through traffic.

Discussion

The astounding number of automobiles bought and used in America is a direct measure of the popularity of the public road. By their purchase and maintenance of expensive automobiles millions of citizens testify that their favorite recreation in life is country driving.

Automobile drivers have been criticized for speeding through the most delightful landscape with small heed for the beauty of their surroundings. While this criticism lies with some force against a few automobile drivers it surely does not apply to the majority. If the only places for driving were subterranean tunnels with no outlook to the sky or the fields, pleasure driving by automobile would cease at once for all and forever.

An instructive exercise could be provided for the pupils at this point should they be stationed beside any good country road to take a census of the traffic and to determine as nearly as possible how many passengers were using the road for business and how many for pleasure. On nearly all roads the pleasure traffic would be found in a very large majority.

It being therefore the incontrovertible fact that country roads are used mainly for pleasure, it is only the part of wisdom to develop their equipment in this direction, that is to provide the

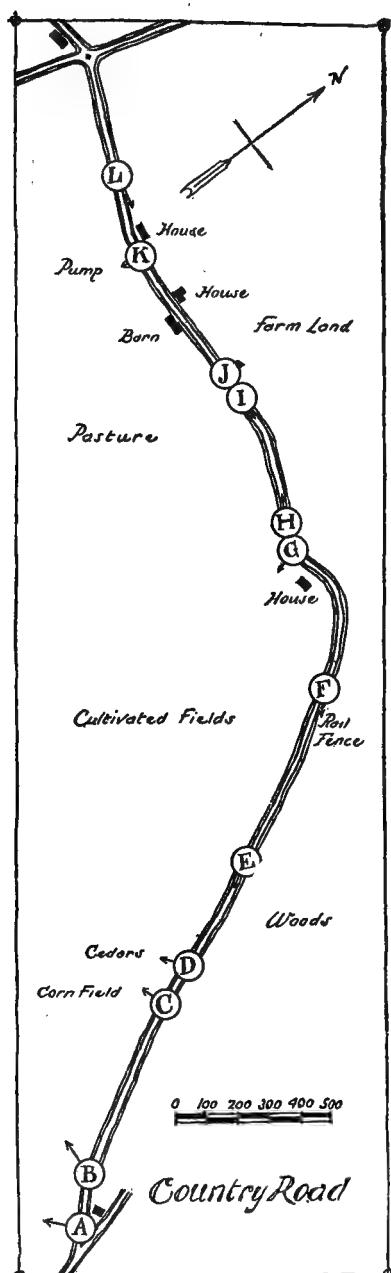


FIG. 137. MAP OF ROAD

pleasantest scenery and most agreeable surroundings possible.

Delightful scenery already exists on many country roads. In fact there is hardly a road anywhere which is not interesting and there are many stretches of extraordinary beauty.

Should any intelligent person, preferably a trained landscape architect, definitely set out to realize the utmost beauty on any given section of country road it would be found that much improvement could be made at little expense. In certain places outlooks could be opened across fine stretches of scenery, vistas could be made up and down streams, better views could be prepared for farms and farm houses, some undesirable views could be covered by planting, new trees could be set along certain stretches of road, native shrubbery could be encouraged, also native flowers. Along with native trees and shrubbery would come native birds.

Indeed very much could be done, but it is not important at this time to exhaust all the details of possible improvement. We wish merely to point out the fact that the road is already beautiful, that it can be made more so, and that the great majority of men and women are already deeply drawn to this type of natural beauty.



FIG. 138. THE CURVING COUNTRY ROAD — Viewpoint H



FIG. 139. JUNIPERS ALONG THE PASTURE FENCE — View D



FIG. 140. ACROSS THE FIELDS FROM VIEWPOINT A



FIG. 141. LOOKING ACROSS THE VALLEY FROM STANDPOINT B

Example

The photographs herewith reproduced (Figures 138-145) offer one example and a characteristic one. These were all made on one stretch of country road, approximately one half mile in length, in Franklin County, Mass. With two exceptions they were all made in one afternoon, so that they do not profit by the kaleidoscopic variety introduced by the changing seasons. One has still to consider what this half-mile of road would offer in the fetching days of



FIG. 142. THE FARM HOUSE FROM VIEWPOINT L

early spring or in autumn with the maples colored, or in midwinter with a snow-covered landscape. Even on this one trip, which was made in August, another hundred pictures could have been taken, each exhibiting a view as interesting and as beautiful as the samples here shown.

This is what the country roads are like. They are at once incomparably beautiful and supremely democratic. They are for everybody. Their beauty is not kept secretly for the delight of an

esoteric clique, as are some of the refinements of classic music and highbrow art.

Seeing the country roads are thus the greatest art galleries in the world, it is highly important that everyone, and especially every landscape gardener, should appreciate their beauty, should help to conserve and develop it, and should do his utmost to popularize and interpret it for the common good.



FIG. 143. A DRINK AT THE PUMP — AT K

Equipment

The pupil should be provided with sketch block or sketch paper, pocket compass, and if possible a good camera.

Study

Each pupil should now be assigned to the study of a specified section of country road, not more than one mile and seldom less than half a mile. Unless a very large class has to be assigned it will be best to let each pupil work independently and alone on a separate stretch of road. It is by no means necessary to the spirit and method

of this exercise that the pupil should study a spectacular or especially "scenic" road. The present effort is rather to find and to exhibit the beauties of the common everyday country highway.

Each pupil should now give earnest and detailed attention to the section of road assigned to him. He should go over it several times, preferably in different weathers and at different hours of the day, not omitting the night. He should locate and estimate every outlook, every tree or group of trees, every established group of wild flowers or shrubbery, every resource of beauty within the roadway. He should consider the interest of every farm house along the way and the beauty of all bordering farms — for farms are beautiful and interesting. Each item in this inventory should be recorded in the notebook.

It should also be located upon a sketch map which the student is to make at the same time. The preparation of such a map (as shown in Figure 137) is made a part of this exercise.

If possible these pictures should all be photographed. If the pupil has no camera he may borrow one. If he is not a photographer he ought to be, and there will never be a better opportunity to learn than right here.



FIG. 144. THE CORNFIELD — VIEWPOINT C

The finished photographs should be marked and referred to their respective stations on the map. If the map is made to a large scale it will be possible to mount the photographs directly on the map with lines connecting each picture with its station. Such a study is instructive to the maker and interesting to others. If



FIG. 145. IN THE THICK OF THE WOODS — from Viewpoint E

several members of a class can bring together a series of such studies the results will be especially agreeable.

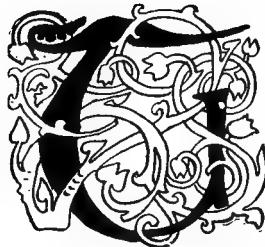
Finally the pupil should now consider and report what practicable changes can be made in the road thus studied in order to make it more interesting and delightful to those who travel there.

Questions

1. What might practicably be done to improve the scenery along country roads in your neighborhood?
2. By whom should this be done? and how?
3. Are there advertising bill-boards along any of the roads in your neighborhood? Who owns them? Whom do they benefit? How can they be abolished?
4. How can travelers be made to see and appreciate more fully the beauties already existing along country roads?

LESSON 58

LANDSCAPE TYPES — THE BROOK



THE purpose of this lesson is to make an intimate study of a specific landscape motive or what is more properly speaking a landscape type, namely a brook. This lesson is also intended to serve as a model upon which the teacher will provide other lessons with which to introduce his pupils to other landscape types and motives which may happen to be available in their neighborhood.

Landscape Types and Motives

A landscape type may be roughly defined as a generalized form — one which is widely repeated. The principal types are as follows:

Mountains.

Hills. There are many different kinds of hills forming sub-types.

Plains, including prairies and deserts.

Valleys.

Cultivated and inhabited farming country.

The Ocean.

Lakes of many sizes and kinds.

Rivers.

Brooks.

Forests.

A landscape motive may be roughly defined as the most prominent and most frequently repeated feature in a given or limited area,

as for example in a certain park or along a certain scenic drive. Motive is synonymous with theme or subject; and as any essay, sermon, oration or written treatise must have one definite and unmistakable theme, so must any good work of landscape gardening have one outstanding and instantly recognizable motive.

In the case used for illustration in this lesson the brook might be taken as the motive or theme for the landscape treatment of a park. But brooks in general constitute a landscape type.



FIG. 146. WHERE THE BROOK SINGS TO THE STONES

Argument

Landscape gardening is to be mastered only through the study of the natural landscape, and the natural landscape is to be understood only through long, patient, sympathetic, intimate study of details — of motives and types. The present lesson will indicate how the student may proceed to make a detailed study of a section of a neighboring brook. But the same method should be widely applied to the study of other types of landscape.

In particular the pupil should give the most careful attention to the home landscape — for unless he can see the beauty there it is a waste of time to fare further. The present lesson is illustrated by the study of a brook simply because this motive happens to be ready

to the author's hand. The present writer would be particularly glad to offer rather a study of the prairie motive, for the reason that many thoughtless and unsympathetic persons are given to saying that the prairie landscape is dull, monotonous and uninteresting. Quite the reverse is true, of course. The prairie plains present one of the most noble and inspiring types of landscape on this old globe, and one replete in beauty of detail for those who have eyes to see and hearts to feel.

This is why the teacher is especially urged to provide ample opportunity, through other lessons, specially arranged, for the intimate study of the local

landscape. It would be inexcusable for pupils in Colorado not to discover the beauties of the Rocky Mountains, or of those in South Dakota not to see the glory of the plains.



FIG. 147. A QUIET POOL

Example

To illustrate this method of landscape study let us consider the brook. The accompanying photographs, with several others, were made one October afternoon along less than half a mile of a small pasture brook in Pelham, Mass. By ranging further up and down stream, and especially by coming in various weathers and at different seasons of the year, it would be possible endlessly to multiply pictures of this same brook.

Preliminary study of the problem in hand may begin with these pictures of the Pelham brook. Let the student answer to himself such questions as these: Are you quite clear that this brook presents a beautiful element in the landscape? Would you yourself enjoy visiting it? Have you ever seen such brooks? Did they give you any personal delight? Have you seen other brooks of different character? Were they more or less beautiful than this? How would this brook look in early spring? in winter? Would it be more pleasing at any other season of the year? Do the photographs here shown satisfy you as an exposition of the brook, or do they seem to undervalue the brook as seen in nature? Might certain of these pictures have been improved by changing the point of view, by showing more background or more foreground, by different lighting, or in any other way?

Remark: It will be observed that every one of these pictures includes a human figure. This must not be regarded as an impertinence, nor must these figures seem to draw attention away from the brook. There are two very clear reasons for introducing these human figures here. The first is that they give scale to the pictures. The second is that *in landscape gardening the landscape has no significance whatever except in its relation to human life.* This is a principle of the most fundamental purport, and one upon which the student should reflect often.

Study

After the student has given careful thought to the foregoing argument and to the example of the brook here illustrated he should proceed to make a much more thorough study of some landscape motive or motives in his own neighborhood. In this study a good camera will be of the utmost service. Let the student take an assigned area (never more than a square mile; usually much less) of woodland, pasture, lake shore, cultivated farm land, canyon, sand dune, or any other type of landscape within easiest reach. Let him select the leading motive to be found on this area. Then, confining himself as closely as possible to the chosen motive, let him make a series of the very best photographs of which he or his camera are capable, his object being to find the utmost beauty and to show as many phases of that beauty as his invention can display. It will complicate his problem somewhat, but it will make the final result better, if he will use one or two human figures in his photographs for the reasons indicated above.

It will be desirable to have several members of the same class study the same area quite independently of one another. If there are more than five members in the section, however, it is recommended that they be assigned to other areas.

After the photographs are all made and finished they should be grouped and brought into one general exhibit. At that time the entire ground should be covered with questions like those already suggested: Do these pictures justly present a landscape motive? Do they show a landscape type? In how far have they failed to present the subject at its best? What remains to be told? Would other weather conditions or other seasons of the year add materially to the scenic resources of the area studied? Are the natural resources of this area such as to warrant the landscape gardener in making a park here? What would the landscape gardener do to enhance the natural beauties as discovered in the present study?

If members of the class can not be equipped with cameras for



FIG. 148. THE TROUT POOL



FIG. 149. THE FISHERMAN BREWS SOME TEA

this study it will be necessary for each student to analyze the scenery of the assigned area in the same way, to select a leading landscape motive, then to find and fix definite points of view from which certain aspects of the selected motive may be seen to best advantage. In default of the photograph, full descriptive notes must be made on each of these views, and upon this basis class discussions may be undertaken.

When the class is constrained to study an area in this way without a camera it will be most desirable, after each pupil has made his individual studies and notes, for the class and teacher to visit the ground and to conduct their discussions in the presence of the specific views selected and marked (by stakes) by the pupils.

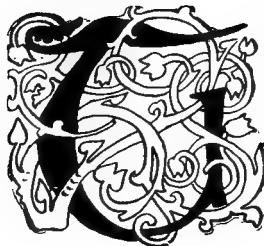
Reference Reading

If possible read in this connection WAUGH'S, *The Natural Style in Landscape Gardening*, pages 43-73.

JOHN C. VANDYKE, *Nature for its Own Sake*.

LESSON 59

THE LANDSCAPE LINKS



HIS lesson is intended to provide a method for the intensive study of some favorable tract of native landscape. This landscape is to be studied with the special purpose of learning its pictorial possibilities, whether developed or latent

General Plan

The general plan of this exercise is to have the instructor lay off a series of fixed views along a definite course. Hence the term "the landscape links," these stations being placed in a circuitous series like the holes in a golf links. Except for this distinctive name the exercise might better be compared to the afternoon walk, in which one tramps leisurely from point to point, stopping to contemplate at ease each good view.

Directions

The instructor should choose any tract of interesting land. The more varied its topography and the more interesting its scenery the better. But no excuses are to be made. It is not necessary, nor even desirable, to include the Rocky Mountains, Niagara Falls and the Big Trees in any landscape links. Specially favorable opportunities will be found along small streams, but any open pasture will do. Even cultivated farm land presents interesting scenery, or a really delightful series of views could be laid off along crowded city streets. The instructor in laying out his landscape links should use his imagination to full capacity, and if this organ serves him well there will be no need to complain of the landscapes offered by nature.

After the instructor has familiarized himself thoroughly with



FIG. 150. THE CORN FIELD



FIG. 151. UPLANDS — FIELDS AND WOODS

THE LANDSCAPE LINKS



FIG. 152. A SUNNY ROAD



FIG. 153. WHITE OAKS — SWEET FERN IN FOREGROUND

the area under study he will fix upon several stations where the best pictures are to be seen. The desirability of each station may be estimated by photographing it or even by imagining how it would appear in a photograph. An essential feature of this exercise lies precisely here, viz., in separating specific views from their context. The casual and uninstructed observer often fails to see the most intimate beauties of the landscape because he does not focus his attention upon them. He "can not see the forest for the trees," or, quite as probably, he does not see the beauty of a particular tree because it is in a forest.

As each one of these pictures is selected the exact point from which it is to be viewed should be fixed. At the point of view a stake may be driven. Upon the stake an arrow may be set pointing to the desired spot. The successive stakes in the landscape links may be numbered in series.

The number of stations in this series should not be less than six nor more than twelve. Obviously it will be desirable to make these as different in subject matter as the resources of the area permit. Some views should open toward distant prospects; some should focus upon definite objects in middle distances; some should be directed to objects in the immediate foreground, as to a group of wild flowers, or even to a mass of lichens upon a stone.

The subjects of these views may be infinitely varied, such as distant views of mountains, lakes, cities; middle ground views of houses, fences, roads, water, brooks, waterfalls, bridges; or "close-up" foreground pictures of trees, shrubs, flowers, a bird's nest, a wayside well, a stile, a park seat. But let it be remembered that not more than twelve subjects are to be included in any one program.

It will make the exercise more workable, especially for a large class, if a printed program of views is handed to each student, somewhat in the following form:



FIG. 154. YOUNG HICKORIES



FIG. 155. YOUNG WHITE PINES

Landscape Links Program

1. Looking N.W., group of large hickory trees.
2. Looking W., masses of shrubbery along old fence.
3. Distant view, looking S. across farm land to Eberle's Hill.

Illustration

An example of the manner in which this exercise may be worked out is shown in the photographs, Figures 150-156. These are selected from an even dozen made within an hour one September afternoon

on an area of approximately 40 acres of rough farm and pasture land in Pelham, Mass., using an ordinary kodak.

Equipment

The pupils are now to be taken over the course prepared by the instructor. They should have as much time as practicable; but one afternoon is ample for the study of an appropriate landscape links where not exceeding twelve stations are located within two miles walk. Each student must have notebook and pencil. If possible each student should also have a camera; and under any arrangement one good camera with competent operator should accompany the class.

Study

Each pupil should make up his notes in such a way as to enable him to answer the following questions. These replies should be fully written out as soon as possible after completing the field study.

The Whole Collection

1. Photograph or sketch each view.
2. Describe and characterize each view briefly but accurately.
3. Is there any order, sequence, climax or other relation in the series?
4. Might any rearrangement, addition or omission improve the series?
5. On what principle should this series of views be arranged?

Particular Views

6. Criticize each view in detail. Could it be improved? If so, how?
7. Each point of view might have been better chosen: Criticize.
8. Which is the most pleasing view? Why?

9. Is the value of any view influenced by extraneous associations?

General Questions

10. Which views are best, — foreground, middle ground, or distance?
11. At what distance do trees give the best effect? Running water? Still water? Buildings? Lawn? Meadow?
12. Would different atmospheric or weather conditions make different answers necessary to any questions on this sheet? For instance?
13. Would this course of views be worth while in mid-winter, or at any other season of the year?

When these replies have been written out, preferably upon the day following the field study, the entire class should be assembled for discussion. If photographs of the episodes in the landscape links can be on exhibition at this time the class conference will be greatly assisted. (It may be wise, with this in view, for the instructor to have a set of photographs prepared in advance.)

The several questions set above should then be taken up for free discussion. Questions 3, 5, 8 and 12 may be regarded as having special importance. It should be realized by all that a full agreement among members of a class is

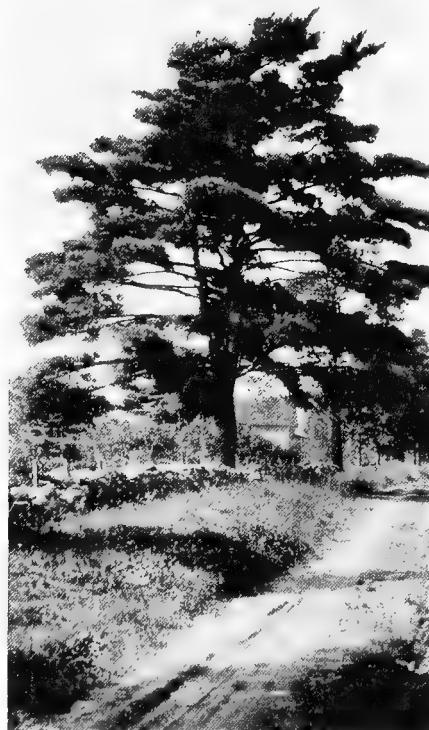


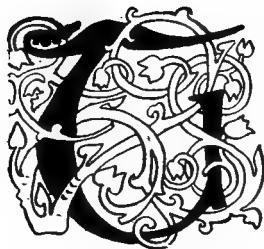
FIG. 156. OLD PINE TREE

not to be expected nor desired, especially upon such a question of personal preference as question 8 — though this is one of the most important questions of all.

It will be found most interesting for the class, having completed this work, to go over the same course a month or two later, especially after the fall of foliage or other seasonal change makes conspicuous alterations in the landscape.

LESSON 60

NATIONAL PARKS AND FORESTS



THE purpose of this lesson is to acquaint the pupil with the very large and immeasurably valuable reservations of natural scenery held by the governments of the United States and the Dominion of Canada for the use of the public. Every well-informed citizen should know something of the extent of these resources, where they are located, the special qualities of the more important territories, how they are protected, administered and used.

Argument

Certain areas of superlative grandeur are preserved especially in the National Parks. The Grand Canyon in Arizona and the Geysers of the Yellowstone are outstanding examples of this sort. Everyone would certainly wish to have such wonders of nature preserved forever and made always freely accessible to all comers.

After these come great types of natural scenery, which though widely multiplied, are of such unquestionable beauty and worth that they should always be available for public study and enjoyment. Thus, the fascinating scenery of the Rocky Mountains is preserved and made accessible to all comers in Rocky Mountain National Park, Pike National Forest, Arapaho National Forest, White River National Forest and others. The splendid forests of the northwest are exemplified in Rainier National Park and the Olympic National Forest.

Then, there are many areas of historic or prehistoric interest, such as Mesa Verde National Park, Bandelier National Monument

and Gettysburg National Park. These should be kept open and accessible in the public interest.

Without attempting further to classify and catalog these public uses we may say finally that wide ranges of wild territory, pref-



FIG. 157. OLD FAITHFUL AT SUNRISE — YELLOWSTONE NATIONAL PARK. — Photograph by HAYNES

erably country of good landscape, containing forests, lakes, and streams, are of high value for general recreation. These uses include hunting, fishing, camping, mountain climbing, hiking, etc. The public reservations now under administration in the United States are being used at the present time by about 5,000,000 persons annually, a number which is increasing rapidly. The great body of recreation thus provided has an immeasurable educational and spiritual value. It also has an assignable commercial value which may be roughly estimated at from \$5,000,000 to \$10,000,000.

The serious student ought to inform himself fully regarding the methods by which national parks, forests and monuments are established, protected and administered; but most of all he should make for himself the opportunity to visit as many as possible of these possessions in which he is himself part owner.



FIG. 158. PIEGAN MOUNTAIN, GLACIER NATIONAL PARK
Photograph by ROBERT STERLING YARD

National Parks

The American National Parks, as popularly understood, are administered by the National Park Service, a bureau in the Department of the Interior. There are, however, seven other public parks administered by the War Department. These are all shown in the following lists:

TEXTBOOK OF LANDSCAPE GARDENING

NATIONAL PARKS
Administered by Interior Department

Name	Location	Created	Acres
Crater Lake.....	Oregon.....	1902	159,360
General Grant.....	California.....	1890	2,536
Grand Canyon.....	Arizona.....	1908	613,120
Glacier.....	Montana.....	1910	981,681
Hot Springs.....	Arkansas.....	1832	912
Hawaii.....	Hawaiian Islands.....	1916	75,295
Lafayette.....	Maine.....	1916	5,000
Lassen Volcanic.....	California.....	1907	79,561
Mesa Verde.....	Colorado.....	1906	48,966
Mount McKinley.....	Alaska.....	1917	1,498,000
Mount Rainier.....	Washington.....	1899	207,360
Platt.....	Oklahoma.....	1902	848
Rocky Mountain.....	Colorado.....	1915	254,327
Sequoia.....	California.....	1890	161,597
Sully's Hill.....	North Dakota.....	1904	780
Wind Cave.....	South Dakota.....	1903	10,899
Yellowstone.....	Wyoming, Idaho, Montana	1872	2,142,720
Yosemite.....	California.....	1890	719,622
Zion.....	Utah.....	1909	76,800
			<u>7,039,384</u>

NATIONAL PARKS
Administered by War Department

Antietam Battlefield.....	Maryland.....	1890	50
Chickamauga and Chattanooga.....	Georgia and Tennessee.....	1890	6,543
Gettysburg.....	Pennsylvania.....	1895	2,451
Guilford Court House.....	North Carolina.....	1917	125
Lincoln's Birthplace.....	Kentucky.....	1916	1
Vicksburg.....	Mississippi.....	1898	1,323
Shiloh.....	Tennessee.....	1894	3,546
			<u>14,039</u>



FIG. 159. ROCKY MOUNTAIN NATIONAL PARK, COLORADO
Photograph by FRED C. SEARS

National Forests

The National Forests, established primarily for the growing of lumber and the protection of water sheds, have developed a number of other utilities, such as the grazing of sheep and cattle; but they are also of great importance in the protection of scenery and the development of vast recreation and health utilities. They are administered by the Forest Service, which is a bureau of the Department of Agriculture. The present areas of the National Forests in the United States are as follows:*

*This list is given as of 1921. As there are frequent minor changes in forest boundaries, these figures should not be used without verification. In the same way it is desirable always to get the latest data when accuracy is desired with regard to National Parks and Monuments.

TEXTBOOK OF LANDSCAPE GARDENING

NATIONAL FORESTS, UNITED STATES

Forest	State	Net Area, Acres
Absaroka.....	Montana.....	841,079
Alabama.....	Alabama.....	65,167
Angeles.....	California.....	818,782
Apache.....	Arizona.....	1,236,665
Arapaho.....	Colorado.....	634,485
Arkansas.....	Arkansas.....	640,136
Ashley.....	Utah-Wyoming.....	980,096
Battlement.....	Colorado.....	653,583
Beartooth.....	Montana.....	660,680
Beaverhead.....	Montana.....	1,339,568
Bighorn.....	Wyoming.....	1,124,617
Bitterroot.....	Montana.....	1,047,420
Blackfeet.....	Montana.....	895,238
Black Hills.....	So. Dak.-Wyo.....	621,084
Boise.....	Idaho.....	1,059,719
Bridger.....	Wyoming.....	713,809
Cabinet.....	Montana.....	829,206
Cache.....	Idaho-Utah.....	769,971
California.....	California.....	817,172
Caribou.....	Idaho-Wyo.....	708,811
Carson.....	New Mexico.....	869,320
Cascade.....	Oregon.....	1,022,431
Challis.....	Idaho.....	1,257,443
Chelan.....	Washington.....	677,592
Cherokee.....	Ga.-N. C.-Tenn.....	179,295
Chugach.....	Alaska.....	5,130,034
Clearwater.....	Idaho.....	785,376
Cleveland.....	California.....	548,661
Cochetopa.....	Colorado.....	907,000
Coconino.....	Arizona.....	1,769,207
Coeur d'Alene.....	Idaho.....	663,531
Colorado.....	Colorado.....	853,641
Columbia.....	Washington.....	785,227
Colville.....	Washington.....	754,737
Coronado.....	Ariz.-New Mexico.....	1,430,381
Crater.....	Oregon-Calif.....	851,630

NATIONAL PARKS AND FORESTS

NATIONAL FORESTS, UNITED STATES

Forest	State	Net Area, Acres
Crook.....	Arizona.....	890,228
Custer.....	Mont.-S. Dak.....	592,501
Datil.....	New Mexico.....	2,642,245
Deerlodge.....	Montana.....	830,464
Deschutes.....	Oregon.....	1,283,808
Dixie.....	Utah-Ariz.-Nevada.....	509,110
Eldorado.....	Calif.-Nevada.....	553,718
Fillmore.....	Utah.....	700,890
Fishlake.....	Utah.....	656,901
Flathead.....	Montana.....	1,707,912
Florida.....	Florida.....	317,511
Fremont.....	Oregon.....	849,526
Gallatin.....	Montana.....	567,614
Gila.....	New Mexico.....	1,559,530
Gunnison.....	Colorado.....	905,409
Harney.....	South Dakota.....	526,055
Hayden.....	Wyo.-Col.....	393,571
Helena.....	Montana.....	680,134
Holy Cross.....	Colorado.....	1,171,961
Humboldt.....	Nevada.....	1,308,207
Idaho.....	Idaho.....	1,879,284
Inyo.....	Calif.-Nev.....	1,260,586
Jefferson.....	Montana.....	1,042,884
Kaibab.....	Arizona.....	752,339
Kaniksu.....	Wash.-Idaho.....	455,083
Klamath.....	Calif.-Ore.....	1,533,237
Kootenai.....	Montana.....	1,332,353
La Sal.....	Utah-Col.....	537,629
Lassen.....	California.....	950,484
Leadville.....	Colorado.....	928,954
Lemhi.....	Idaho.....	1,095,938
Lewis and Clark.....	Montana.....	810,891
Lincoln.....	New Mexico.....	1,123,975
Lolo.....	Montana.....	850,677
Luquillo.....	Porto Rico.....	12,443
Madison.....	Montana.....	931,885

TEXTBOOK OF LANDSCAPE GARDENING

NATIONAL FORESTS, UNITED STATES

Forest	State	Net Area, Acres
Malheur.....	Oregon.....	1,043,777
Manti.....	Utah.....	781,575
Manzano.....	New Mexico.....	697,488
Medicine Bow.....	Wyoming.....	477,794
Michigan.....	Michigan.....	89,466
Minidoka.....	Idaho-Utah.....	577,997
Minnesota.....	Minnesota.....	190,602
Missoula.....	Montana.....	1,030,717
Modoc.....	California.....	1,460,402
Mono.....	Calif.-Nev.....	1,250,017
Monongahela.....	Vir.-W. Vir.....	53,335
Montezuma.....	Colorado.....	698,222
Nantahala.....	Ga.-N. C.-S. C.....	201,776
Natural Bridge.....	Virginia.....	97,328
Nebraska.....	Nebraska.....	205,944
Nevada.....	Nevada.....	1,174,621
Nezperce.....	Idaho.....	1,626,627
Ochoco.....	Oregon.....	718,024
Okanogan.....	Washington.....	1,488,410
Olympic.....	Washington.....	1,535,506
Oregon.....	Oregon.....	1,053,700
Ozark.....	Arkansas.....	286,849
Payette.....	Idaho.....	1,197,511
Pend Orielle.....	Idaho.....	674,766
Pike.....	Colorado.....	1,093,156
Pisgah.....	North Carolina.....	202,843
Plumas.....	California.....	1,144,418
Powell.....	Utah.....	683,580
Prescott.....	Arizona.....	1,447,850
Rainier.....	Washington.....	1,316,679
Rio Grande.....	Colorado.....	1,135,167
Routt.....	Colorado.....	744,856
St. Joe.....	Idaho.....	556,438
Salmon.....	Idaho.....	1,620,387
San Isabel.....	Colorado.....	598,912
San Juan.....	Colorado.....	1,240,168

NATIONAL PARKS AND FORESTS

NATIONAL FORESTS, UNITED STATES

Forest	State	Net Area, Acres
Santa Barbara.....	California.....	2,021,031
Santa Fe.....	New Mexico.....	1,364,585
Santiam.....	Oregon.....	607,097
Sawtooth.....	Idaho.....	1,159,352
Selway.....	Idaho.....	1,688,287
Sequoia.....	California.....	1,879,809
Sevier.....	Utah.....	720,235
Shasta.....	California.....	824,071
Shenandoah.....	Va.-W. Va.....	276,404
Shoshone.....	Wyoming.....	1,579,316
Sierra.....	California.....	1,493,400
Siskiyou.....	Calif.-Ore.....	1,346,905
Sitgreaves.....	Arizona.....	650,115
Siuslaw.....	Oregon.....	546,292
Snoqualmie.....	Washington.....	693,733
Stanislaus.....	California.....	810,802
Superior.....	Minnesota.....	857,018
Tahoe.....	Calif.-Nev.....	545,063
Targhee.....	Idaho-Wyoming.....	1,321,691
Teton.....	Wyoming.....	1,924,497
Toyiabe.....	Nevada.....	1,871,464
Tongass.....	Alaska.....	15,449,302
Tonto.....	Arizona.....	1,988,806
Trinity.....	California.....	1,409,010
Tusayan.....	Arizona.....	1,298,115
Uinta.....	Utah.....	1,007,145
Unaka.....	Tenn.-N. C.-Va.....	117,539
Umatilla.....	Oregon.....	1,228,793
Umpqua.....	Oregon.....	1,010,633
Uncompahgre.....	Colorado.....	786,239
Wallowa.....	Oregon.....	957,419
Wasatch.....	Utah.....	605,476
Washakie.....	Wyoming.....	852,315
Washington.....	Washington.....	1,459,748
Weiser.....	Idaho.....	561,575
Wenatchee.....	Washington.....	657,034



FIG. 160. IN CAMP, SAN ISABEL NATIONAL FOREST, COLORADO

NATIONAL FORESTS, UNITED STATES

Forest	State	Net Area, Acres
White Mountain.	N. H.-Me.	415,254
White River.	Colorado.	845,104
Whitman.	Oregon.	1,313,738
Wichita.	Oklahoma.	61,480
Wyoming.	Wyoming.	974,514
	Net Total	156,666,045



FIG. 161. DOLLY COPP CAMP GROUND, WHITE MOUNTAINS NATIONAL FOREST,
NEW HAMPSHIRE

National Monuments

The government of the United States further maintains an important series of public reservations, of rather miscellaneous character, under the denomination of National Monuments. A National Monument differs from a National Park in that the former is established by presidential proclamation, whereas the latter is set aside by act of Congress. The latter action is harder to accomplish and harder to set aside; and this difference gives a sort of theoretical measure of the difference in importance of the Parks and the Monuments.

The National Monument differs further in its administration, being placed under the care of any branch of the government which happens to be already on the ground and in charge of the land.

The Monuments now in existence in the United States are as follows:

NATIONAL MONUMENTS
Administered by Interior Department

		Established	Acres
Casa Grande.....	Arizona.....	1892	480
Capulin Mountain.....	New Mexico.....	1916	681
Chaco Canyon.....	New Mexico.....	1907	20,629
Colorado.....	Colorado.....	1911	13,883
Devil's Tower.....	Wyoming.....	1906	1,152
Dinosaur.....	Utah.....	1915	80
El Morro.....	New Mexico.....	1906	240
Gran Quivira.....	New Mexico.....	1909	500
Katmai.....	Alaska.....	1918	1,088,000
Lewis and Clark Cavern.....	Montana.....	1908	160
Montezuma Castle.....	Arizona.....	1906	160
Muir Woods.....	California.....	1908	295
Natural Bridges.....	Utah.....	1908	2,740
Navajo.....	Arizona.....	1909	360
Papago Saguaro.....	Arizona.....	1914	2,050
Petrified Forest.....	Arizona.....	1906	25,625
Pinnacles.....	California.....	1908	2,080
Rainbow Bridge.....	Utah.....	1910	160
Scott's Bluff.....	Nebraska.....	1919	2,054
Shoshone Cavern.....	Wyoming.....	1909	210
Sitka.....	Alaska.....	1910	57
Tumacacori.....	Arizona.....	1908	10
Verendrye.....	North Dakota.....	1917	253
Yucca House.....	Colorado.....	1919	10
			1,161,869

NATIONAL PARKS AND FORESTS

NATIONAL MONUMENTS*Administered by Agricultural Department*

		Established	Acres
Bandelier.....	New Mexico.....	1916	22,075
Devil's Postpile.....	California.....	1911	800
Gila Cliff Dwellings.....	New Mexico.....	1907	160
Jewel Cave.....	South Dakota.....	1908	1,280
Mount Olympus.....	Washington.....	1909	299,370
Oregon Caves.....	Oregon.....	1909	480
Tonto.....	Arizona.....	1907	640
Walnut Canyon.....	Arizona.....	1915	960
Wheeler.....	Colorado.....	1908	300
			326,104

NATIONAL MONUMENTS*Administered by War Department*

Big Hole Battlefield.....	Montana.....	1910	5
Cabrillo.....	California.....	1913	1
			6

Canadian National Parks

The Dominion of Canada also maintains a gallant array of National Parks, including much of the very finest scenery on the North American continent. These are administered by the Conservation branch of the Department of the Interior. Following is a catalog of existing parks:



FIG. 162. RAINBOW BRIDGE NATIONAL MONUMENT, ARIZONA

Canadian National Parks

Rocky Mountains Park, Alberta, east slope of Rockies, established 1885; area 2,751 sq. miles. Ideal Mountain Playground containing the two famous resorts, Banff and Lake Louise, with much of the finest scenery of east slope of Central Rockies. Massive formation of stratified sedimentary rock, upper slopes much worn and castellated, or glacier crowned, lower slopes covered with luxuriant forests and flower carpeted alplands. Glacier-fed lakes of exquisite coloring, wild deer, goat, sheep, elk, etc.

Yoho Park, British Columbia, west slope of Rockies, established 1886; area 476 sq. miles. Rugged scenery of west slope of Rockies, narrow transverse valley of Kickinghorse, precipitous peaks, large number with permanent ice caps or glaciers, wonderful

NATIONAL PARKS AND FORESTS

Yoho valley with falls over 1200 feet in height. Four great snow-fields at head. Natural bridge. Emerald lake, lakes O'Hara and McArthur.

Glacier Park, British Columbia, summit of Selkirks, established 1886; area 468 sq. miles. More massive formation of older range. Peaks worn down almost to timber line crowned with innumerable glaciers; luxuriant forests, alpine flower gardens. One of the best centres for alpine climbers and students of glacier formation, Illecillewaet and Asulkan valleys and glaciers, Nakimu caves, Marion Lake, Rogers and Baloo passes.

Revelstoke Park, British Columbia, established 1914; area 95 sq. miles. Fourteen-mile motor drive up Mt. Revelstoke affording panoramic views of Columbia and Illecillewaet Valleys, Clachna-Coodin ice-field, Lakes Eva and Millar. Winter sports resort, game preserve.

Kootenay Park, British Columbia, established 1920; area 587 sq. miles. Highway park extending 5 miles on each side of new Vermilion-Sinclair section of Banff-California highway. Passes through wonderful and practically unknown mountain scenery. Large rivers, towering canyons, Briscoe Range, Ice Lake, Sinclair Canyon, and Radium Hot Springs. Bear, deer, caribou and sheep.

Jasper Park, Northern Alberta, established 1907; area, 4,400 sq. miles. Immense mountain wilderness, partly unexplored, rich in historic associations. Numbers of unclimbed peaks, glaciers, snow fields, canyons, innumerable lakes of wonderful coloring. Athabaska valley, Maligne lake, gorge and canyon, Mt. Edith Cavell, Miette Hot Springs, Mt. Robson, highest known peak in Canada. Largest big game sanctuary in world.

Waterton Lakes Park, Southern Alberta, adjoining U. S. Glacier Park, established 1895; area, 423 sq. miles. Mountains noted for beauty of coloring; lovely lakes, waterfalls and snow-peaks, excellent trout fishing, favorite camping resort.

St. Lawrence Islands, Ontario, established 1905; area 140 acres. Thirteen islands and one mainland reservation among the

Thousand Islands of the St. Lawrence river equipped for the use of summer campers and visitors.

Broder Park, Ontario, established 1919; area 20 acres; additional island opposite Morrisburg recently added to above reservation.

Pt. Pelee Park, Ontario, on Lake Erie, established May 29th, 1918. Most southerly point in Canada; northern limit of many migratory birds; summer resort and bird reserve; unique fauna and flora.

Buffalo Park, New Wainwright, Alberta, established 1907; area, 158.75 sq. miles. Fenced enclosure, home of the Government's great buffalo herd — 5000 buffalo, also moose, elk, deer, yak and cattalo.

Elk Island Park, near Lamont, Alberta, established 1899; area 16 sq. miles. Smaller fenced enclosure contains about 200 buffalo, also moose, elk and deer.

Foremost Antelope reserve, Southern Alberta, reserved by Order of Minister; area 9 sq. miles. Fenced reserve containing about 100 antelope.

Fort Howe, New Brunswick, established 1914; area 19 acres. Associated with earliest history of province. Site of landing of United Endeavor Loyalists.

Fort Anne, Nova Scotia, established 1917. Fort Annapolis Royal played important part in early history of Canada, first vessel constructed and first grist-mill erected in North America, the centre of civilization and progress in Acadia and of the fiercely contested struggle between France and England for the possession of the continent.

Canadian National Forests

The Dominion of Canada has also in process of formation a great National Forest system in every way comparable to that of the United States. The areas already set aside are shown in the following memorandum:

NATIONAL PARKS AND FORESTS

The Long Lake Forest Reserve situate in the province of British Columbia; area 264.21 square miles.

The Monte Hills Forest Reserve situate in the province of British Columbia; area 182.75 square miles.

The Martin Mountain Forest Reserve situate in the province of British Columbia; area 34 square miles.

The Niskonlith Forest Reserve situate in the province of British Columbia; area 318.5 square miles.

Tranquille Forest Reserve situate in the province of British Columbia; area 290.6 square miles.

Hat Creek Forest Reserve situate in the province of British Columbia; area 340.25 square miles.

Larch Hills Forest Reserve situate in the province of British Columbia; area 25 square miles.

Riding Mountain Forest Reserve situate in the province of Manitoba; area 1535 square miles.

Turtle Mountain Reserve situate in the province of Manitoba; area 109.25 square miles.

Spruce Woods Forest Reserve situate in the province of Manitoba; area 224.5 square miles.

Duck Mountain Forest Reserve No. 1 situate in the province of Manitoba; area 1,462.25 square miles.

Porcupine Forest Reserve No. 1 situate in the province of Manitoba; area 777.5 square miles.

Beaver Hills Forest Reserve situate in the province of Saskatchewan; area 99 square miles.

Pines Forest Reserve situate in the province of Saskatchewan; area 166.15 square miles.

Moose Mountain Forest Reserve situate in the province of Saskatchewan; area 156 square miles.

Porcupine Forest Reserve No. 2 situate in the province of Saskatchewan; area 564.75 square miles.

Duck Mountain Forest Reserve No. 2 situate in the province of Saskatchewan; area 81 square miles.

Cypress Hills Forest Reserve No. 2 situate in the province of Saskatchewan; area, 72 square miles.

Nisbet Forest Reserve situate in the province of Saskatchewan; area 149.49 square miles.

The Cooking Lake Forest Reserve situate in the province of Alberta; area 111.50 square miles.

Cypress Hills Forest Reserve No. 1 situate in the province of Alberta; area, 81 square miles.

The Rocky Mountains Forest Reserve situate in the province of Alberta; area 20,896.65 square miles.

Fort a la Corne Forest Reserve situate in the province of Saskatchewan; area 513 square miles.

Lesser Slave Forest Reserve situate in the province of Alberta; area 5,023 square miles.

Nicola Forest Reserve situate in the province of British Columbia; area 505.75 square miles.

Fly Hill Forest Reserve situate in the province of British Columbia; area 223.75 square miles.

Arrowstone Forest Reserve situate in the province of British Columbia; area 255 square miles.

Mount Ida Forest Reserve situate in the province of British Columbia; area 45.25 square miles.

Study

The pupil should study the foregoing catalogs of parks, forests and monuments. While it can not be expected that the ordinary citizen will commit to memory all these names, with the location and characteristics of each area, yet everyone should have a clear idea of the extent and importance of these reservations. Several of the most notable National Parks should be known by name with their outstanding features.

It will certainly not be too much to require each pupil to know all the parks, forests and monuments which happen to be situate in his own state. This may be considered a fixed assignment.

NATIONAL PARKS AND FORESTS

It is desirable further, for the sake of general information, for each pupil to read as many books as possible from the list of references given below.

If the teacher or members of the class have visited important parks, forests, or monuments, it will be desirable to receive from them their personal accounts of the places visited. Photographs, lantern slides, maps and other materials are sometimes available so as to give additional vividness to the common knowledge of these reservations. All such helps should be utilized to the utmost.

Questions

1. What are the leading National Parks, both in the United States and Canada? And what are the outstanding features of each?
2. What are the most important National Monuments?
3. What National Forests contain especially important scenery?
4. What are the practical and legal differences between National Parks, National Forests and National Monuments?
5. Why are these Parks, Forests and Monuments mainly in the western states?
6. Would it be desirable to increase such national holdings largely in the middle, eastern and southern states? How could it be done?
7. What line of distinction should be maintained between National Parks and State Parks? Between National Forests and State Forests?
8. Are there important areas still outside these national reservations which should be brought in either as National Parks or National Forests?

Reference Readings

YARD, Book of the National Parks.

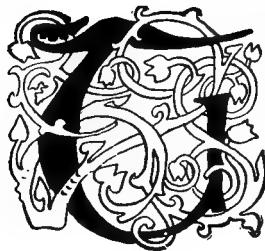
ALLEN, Guide to National Parks of America.

MUIR, Our National Parks.

BOERKER, Our National Forests.

LESSON 61

STATE PARKS



THE purpose of this lesson is to emphasize the importance of state parks, to present some of the principles which should govern in the development of a state park system, and to lead each student most seriously to consider the conditions of his own state in this matter.

Argument

The immeasurable value for health and recreation of large tracts of virgin scenery has generally been overlooked. Yet outdoor recreation amidst wild scenery is especially appreciated by Americans. Up to quite recent times, however, there was so much wild country on this continent that no one considered the necessity of preserving such lands for future generations or protecting them for present use. But as the country has filled up, as population has increased, and as life has crowded into cities, these needs have become increasingly manifest, until now the need of such reservations of scenery is pretty generally acknowledged.

Now the national provision of parks, forests and national monuments, magnificent though it be, is by no means sufficient. Especially as circumstances have determined that the largest national reserves should be located in the areas having relatively small populations, leaving the crowded cities and heavily settled areas far from these national reserves, it becomes important that the states do something for themselves, and this duty is plainly most pressing upon those states which lie farthest from the great parks and forests but which have the most congested populations.

Every state, moreover, no matter where it is located, will have



FIG. 163. WATTERSON POINT, ST. LAWRENCE RESERVATION, NEW YORK STATE

some areas which ought to be saved and consecrated to public use. There will be lakes, rivers, stretches of seashore, mountains and other types of natural scenery for which all good citizens will naturally feel a deep love and reverence. There will be spots of special historic interest which should be preserved. All these interests can best be cared for in some sort of state park system.

It is best at this point to avoid drawing any distinctions between state parks and state forests. Indeed there are other kinds of public lands sometimes serving admirably the purposes of state parks, for example reserved watersheds, military reservations, etc. Any fair view of a state's resources will include all such lands which are open to the public, and any plans for the future must give attention to these different forms of land holdings.

A State's Needs

Some effort has been made to establish a ratio of park area to population. For example it used to be thought that a city should have one acre of park to every 200 inhabitants. More lately the estimates have approached a ratio of one acre to each 100 inhabitants. Yet vague as are these estimates they are like the exactness of pure mathematics compared with our knowledge of what the country needs as a whole, outside the city park systems. It is plain that such a ratio could hardly be followed in practice, any way, since densely populated states like Connecticut and Rhode Island could not possibly set aside so much land per capita as should be reserved by large states of sparser population, like Texas or Wisconsin.

Evidently the size of the state is a factor, too, in the computation. Thus we can only say that the area of park land needed varies directly with the size of the state and the density of population, but it would be impossible in the present knowledge of social science to represent these factors in exact figures. We may be pretty sure, however, that whatever may be the theoretically desirable allow-

ance of park lands for a state there will be no probability as matters are now going, that any state will ever get too much. If any state should ever, by any inconceivable chance, set aside more park lands than could be wisely used, then such surplus lands could most certainly be disposed of to advantage at any time.

Desirable Lands

It is of great importance that lands for parks, forests and all similar purposes be set aside at the earliest possible moment. As population grows the need for such properties increases precisely as the difficulty of buying them increases. Very frequently it happens that by the time the need is really felt the possibility of acquiring the desired lands has disappeared, never to return. This law does not spare the most treasured items of landscape nor the most sacred historic relics.

One of the most important points in state park policy, therefore, is to make plans many years ahead — the further into the future the better, — and to acquire all desirable lands just as rapidly as possible.

Some of the things which should be especially regarded in making up a program of state parks are the following:

1. Seashores. Any state which is so fortunate as to border upon the ocean should certainly save some miles of good beaches for the perpetual enjoyment of all its citizens.

2. Lakes and lake shores. These should be reserved with special care in states like Kansas or Oklahoma where such scenery is rare.

3. Rivers — certain sections of special scenic charm or recreation value.

4. Wild mountain lands. Such territory is usually best adapted to forestry.

5. Non-agricultural swamp lands are also often best adapted to forestry.

6. Scenic types. For example Kansas ought to have one or more large prairie parks to be kept as examples of the pristine prairies; Wisconsin should have some examples of the primeval pine forests.

7. Spots of special scenic charm, such as waterfalls, glaciers, caves, or canyons. The Natural Bridge in Virginia, Mammoth Cave in Kentucky and Mt. Orford in the Province of Quebec may be mentioned as examples

8. Places of historic interest.

Administration

There will be a tendency in most states to place parks and forests more and more under some central form of administration, mainly in bureaus of public works or of conservation, sometimes under special state park boards. Certain features of policy in the management of state lands of this sort may be laid down as follows:

1. Acquisition of park and forest lands ought to go forward as rapidly as possible in accordance with well-studied programs.

2. Acquired lands should be protected from fire, commercial exploitation and all forms of strip or devastation. Conservation is the first step in every administration program

3. In general all these areas should be left in their natural condition. A partial exception may be made for forest lands which are to be planted. Conventional "park improvements" are especially to be avoided.

4. The various areas are made accessible to the public, either by railroads, motor roads or trails; but this opening up of territory need not be hastened too rapidly

5. The charms of such scenery, the opportunities for recreation and the social values of these public lands must be made known to the citizens by sane interpretation and conservative advertising. Loud and bombastic propaganda is in poor taste, it is unnecessary and it may do more harm than good.

STATE PARKS

Examples

Several states have already made good beginnings in this field. Special mention may be made of New York, Iowa, Connecticut, Massachusetts, Wisconsin and Minnesota. Merely as an example the following list of Connecticut's state parks may be cited.

CONNECTICUT STATE PARKS

Park	Acres	Town
Sherwood Island.....	30	Westport
Hurd Park.....	455	East Hampton
Mt. Tom.....	219	Litchfield, et al.
Mt. Bushnell.....	84	Washington
Selden Neck.....	122	Lyme
Haystack.....	1	Norfolk
Ivy Mountain.....	50	Goshen
Mohawk Mountain	5	Cornwall
Great Hill.....	10	Portland, et al.
West Peak.....	168	Meriden, et al.
Mashamoquet Brook.....	13	Pomfret
Sap Tree Run.....	22	Pomfret
Macedonia Brook.....	2000	Kent
Bolton Notch.....	70	Bolton
Dart Island.....	1	Middletown
Wharton Brook.....	50	Wallingford, et al.
Buttonball Brook.....	90	Chaplin
Kent Falls.....	200	Kent
Hammonasset Beach.....	500	Madison
Black Pond.....	30	Meriden
Devil's Hop Yard.....	835	East Haddam
Total	4955	



FIG. 164. TURKEY RUN, INDIANA STATE PARK

New York state has been referred to as a leader in the movement for state parks and forests. The following list of present holdings is impressive:

New York State Parks and Forests

The Forest Preserve:

Adirondack Park, over 3,300,000 A. of which over 1,800,000 is state-owned.

Lake George Islands.

Catskill Park, over 575,000 A. of which over 100,000 A. is state-owned.

John Brown's Farm 243 A.

St. Lawrence Reservation or International Park 181 A.

State Reservation at Saratoga Springs 600 A.

Cuba Reservation 500 A.

Curtiss Game Preserve 27 A.

STATE PARKS

State Nurseries 6 in number.

Fish Hatcheries 12, and Game Farms 3 in number.

Parks — Unusual scenic areas; — for recreation uses primarily:

Fire Island Park 118 A.

Palisades Interstate Park about 35,000 A.

Monhansic Lake Reservation 1100 A.

John Boyd Thatcher Park 350 A.

Enfield Falls Reservation 390 A.

Clark Reservation about 75 A.

Battle Island Park 225 A.

Watkins Glen 103 A.

Letchworth Park 1000 A.

Niagara Falls State Reservation 412 A.

Allegany State Park 65,000 A. of which 7000 A. is state-owned.

Historical Areas:

Philipse Manor Hall.

Stony Point Battlefield 35 A.

Washington's Headquarters 6 A.

Temple Hill 75 ft. × 75 ft.

The Clinton House.

The Senate House.

The Schuyler Mansion 2 A.

Bennington Battlefield 171 A.

Saratoga Battle Monument 2 A.

Stark's Knob 4 A.

The Grant Cottage.

Lake George Battlefield 35 A.

Crown Point State Reservation 25 A.

The Guy Park House.

The Sir William Johnson Mansion and Block-house.

The Herkimer Homestead.

Fort Brewerton 1 A.

Battle Island Park 225 A.

Montcalm Park.

Spy Island 1 A.

Newtown Battlefield 16 A.

Areas of Geological Interest:

Palisades Interstate Park about 35,000 A.

John Boyd Thatcher Park 350 A.



FIG. 165. SUGAR LOAF MOUNTAIN — A MASSACHUSETTS STATE PARK

Lester Park 3 A.

Stark's Knob 4 A.

Clark Reservation about 75 A.

Squaw Island.

Letchworth Park 1000 A.

Niagara Falls State Reservation 412 A.

Study

The pupil must first of all make a complete inventory of all the state parks, forests and other reservations in his state. If his state also contains national parks, forests or monuments, or any important reserves of any other nature other than state lands, these should also be listed, but the state properties are to be especially regarded in this study. This list should include a statement of where each area is located and its area. The compilation of this inventory may prove a difficult task, but it should certainly be carried out in full.

Secondly the student should ascertain who is administratively responsible for these areas and what form of management is actually in force. If the state is making appropriations for maintenance the amount of such appropriations should be ascertained. Any other sources of maintenance should likewise be determined.

Lastly the student should consider carefully what additional areas within his state should he set aside as parks, as forests and as historical reservations. Naturally these matters can not be settled without considerable study. Discussion in class groups will tend to clarify everybody's ideas. It will be well for the teacher to require each pupil finally to make a well-studied written report on this subject accompanied by a state map showing existing properties and those proposed for acquisition.

Readings

NOLEN, State Parks, in *Park and Cemetery, Chicago*, March, 1911,
p. 687

LESSON 62

NEIGHBORHOOD PARKS



THE purpose of this lesson is to make clear the distinctive nature and uses of the small neighborhood park, to direct the attention of each student to the needs of his own neighborhood and to suggest methods for meeting such needs.

Reference is made here to neighborhood parks and picnic grounds of a definitely rural nature. Parks and playgrounds in cities are designed to meet quite different conditions, and their selection, planning and management will naturally follow different rules.

Discussion

National parks serve to preserve the great wonders of natural scenery. They will be of large area and necessarily at a considerable distance from the average citizen. State parks will supplement national parks, will preserve types of native scenery and will supply relatively large areas for camping, hunting, fishing, etc. There is still need for small neighborhood parks or picnic grounds. Every community, town or village should have something of this sort — a suitable place, amidst shady woods, by lake shore or streamsides, quickly accessible, where chataquas, dances, church picnics, grange meetings, boy scout meetings, neighborhood and family gatherings of all sorts can be held.

The area need not be large. Three or four acres of land of the right kind will serve admirably, though ten acres is better. While pleasant landscape surroundings are important, and the shade of



FIG. 166. A DARK POOL IN HOLLAND GLEN

good trees particularly desirable, these little parks will not usually attempt grandiose effects in this field. The chief service to be sought is found in a clean, pleasant, accessible social meeting place.

Administration

Picnic grounds and neighborhood parks of this character are found in many communities. The ownership varies greatly, however.

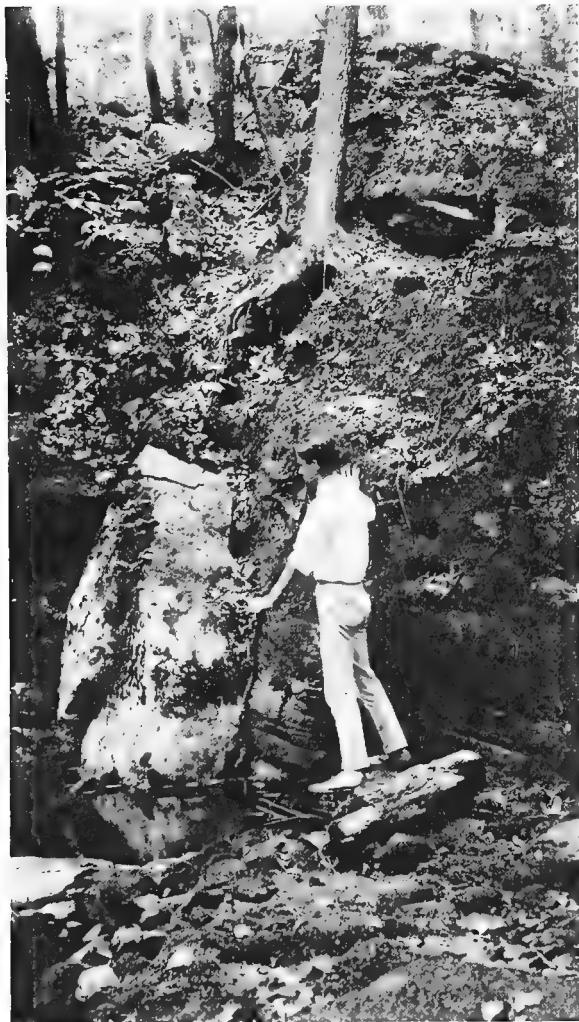


FIG. 167. THE MOSSY ROCKS IN HOLLAND GLEN

In New England, where town government prevails, the town sometimes holds title to such grounds, and this is perhaps the ideal ownership. Occasionally an incorporated village will own land of this nature. Sometimes the title is held by a semi-public organization, as by some church or the grange. Not infrequently such parks are held and managed by trustees. A good many fairly serviceable picnic groves and "amusement parks" are owned and controlled by interurban trolley companies or other transportation agencies, under which circumstances it is usual to charge an admission fee, or to operate concessions for profit.

Any one of these forms of ownership may be entirely satisfactory in given

circumstances. In a particular instance there are likely to be sound preferences; and it will generally be felt that the more

completely the title and management rests with the public the better.

Equipment

The equipment on these neighborhood parks ought to be simple and definitely adapted to well settled uses. Thus if baseball is the favorite local sport, a diamond and bleachers will be provided. If the retired farmers want to play golf (which is certainly better than whittling drygoods boxes and cursing the administration), the necessary putting greens, fairways and other paraphernalia may be supplied. If chataquas or similar meetings are to be frequent an assembly hall may be built or an outdoor theater. If dances are the popular entertainment a good floor is the chief necessity. If camping is undertaken there will need to be safe campfires built and proper attention given to water supply and sanitation. If swimming is customary, dressing rooms should be built. Parking space for automobiles will be a necessity in any case.



FIG. 168. WHERE THE TRAIL GOES IN

Appropriate treatment consists in building those conveniences actually demanded by use,— and nothing else! Fanciful “ornamental” features, such as fountains and flower beds, may better be spared.

Example

Herewith are reproduced photographs taken in a small neighborhood park in Belchertown, Mass. This wild ravine, known as Holland Glen, was saved from the ruin of the lumberman by purchase, the money being raised by popular subscription and the title taken by a board of trustees. The spot is a favorite picnic ground and the patriotic citizens of the neighborhood would not consent to seeing it despoiled.

Every neighborhood has its beauty spots of this order. Clearly they should be preserved for the common enjoyment. The example of Belchertown is deserving of wide emulation.

Study

Each pupil should give searching study to conditions in his own neighborhood. If there be pupils who live in large cities and to whom this study does not directly apply, they should be assigned to the examination of some more rural community. Of course the first step will be to ascertain what provision of neighborhood parks and picnic grounds now exists in the community under study.

Next the question must be asked and answered whether this provision is satisfactory. Has the best spot been chosen? Is it owned and managed to the best public good? Is it properly equipped?

In case it appears that existing provisions are nil or inadequate the pupil should next determine what needs are to be met; then what land can be found which will best serve these needs, then what form of ownership and management are most likely to suit the

STATE PARKS

circumstances, and how the funds are to be raised for financing the project; lastly, what equipment may be necessary.

Report on these points should be made in writing, accompanied by maps, surveys, photographs, etc. Class discussion of these reports will be very desirable.

LITERATURE OF LANDSCAPE GARDENING

The field of landscape gardening has a large, rich and delightful literature. Any student of the subject ought to read widely.

Some books, naturally, deal with history, others with artistic theory, others with engineering phases of the subject, many with plant materials. It is not to be expected that any one book will expound everything.

Fortunately a very large part of the best literature of landscape gardening is in the English language. Much of it is American and much of it is recent. The best is therefore easily accessible.

Every serious student ought to expect to buy a few of the best books for himself. He must use some care, however, to make sure that he is really buying the best books and passing over those which are merely showy.

Every school in which landscape gardening is taught will need a reference library including the leading modern works and as many others as funds will buy. The selection of such a reference library is a matter requiring much thought and investigation.

The following list of books is offered with some misgivings. While it probably includes all the works of most immediate value in the course outlined in the foregoing pages, it is by no means complete, judged by any standard. In order to bring the list within practicable compass and in order to avoid the mistake of confusing the teacher or the pupil not already familiar with this field, it has been necessary to offer a relatively short list, excluding many indubitably good books. Some of the books included are certainly no better than some of those left out, but specific comparisons of this invidious sort would nevertheless be unnecessary, futile, and unfair. It is hoped that this list will be of service to the teacher making up a small reference library or to the student choosing a few books for himself.

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